



DB 1 MGARBCPARL-LLSLSLPLGLPVLGAPPRLLICDSRVLEERYLLEAKEGENATMGCAESC 59  
 QY 61 SLNENITVPDTKVFYAMKRNKXSOQAVEWOGIALLSAVIRGQALLVNSSOPPEPDL 120  
 DB 60 SFSSENTIVPDTKVFYAMKRNKMEVQOQAMEVWOGIALLSAVIRGQALLVNSSOPPEPDL 119  
 QY 121 HYDKAVSGLSRLSTLLRALGAQKEAISPPDA--ASNAAPRTTADTFKRLFFVYSNFLNG 178  
 DB 120 HYDKAVSGLSRLSTLLRALGAQKEAISPPDA--ASNAAPRTTADTFKRLFFVYSNFLNG 179  
 QY 179 KLKLYTGEACRTGDR 193  
 DB 180 KLKLYTGEACRRDR 194

## RESULT 2

QY 09GKA3 PRELIMINARY; PRT; 195 AA.  
 AC 09GKA3;  
 DT 01-MAR-2001 (TREMBlrel. 16, Created)  
 DT 01-MAR-2001 (TREMBlrel. 16, Last sequence update)  
 DT 01-JUN-2002 (TREMBlrel. 21, Last annotation update)  
 DE Erythropoietin.  
 OS Oryctolagus cuniculus (Rabbit).  
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  
 OC Mammalia; Eutheria; Lagomorpha; Leporidae; Oryctolagus.  
 NCBI\_TaxID=9986;  
 RN [1]  
 RP SEQUENCE FROM N.A.  
 RX MEDLINE=21290682; PubMed=11396976;  
 RA Vilalta A., Wu D., Margalith M., Hobart P.;  
 RT "Rabbit Epo Gene and cDNA: Expression of Rabbit Epo after  
 RL Intramuscular Injection of pDNA."  
 RT Biochem. Biophys. Res. Commun. 284:823-827(2001).  
 DR EMBL: AF290943; AAG36961.1; -.  
 DR HSSP: P01588; ICN4.  
 DR InterPro: IPR001323; EPO\_TPO.  
 DR InterPro: IPR003013; Erythroptn.  
 DR Pfam: PF00758; EPO\_TPO; 1.  
 DR PRINTS: PR00272; ERYTHROPTN.  
 DR PROSITE: PS00817; EPO\_TPO; 1.  
 SQ SEQUENCE 195 AA; 21053 MW; 0999DA7D852713F3 CRC64;

Query Match 73.6%; Score 729; DB 6; Length 195;  
 Best Local Similarity 77.9%; Pred. No. 4.1e-62;

Matches 152; Conservative 14; Mismatches 27; Indels 2; Gaps 2;

QY 1 MGVHCPAFLML-LLSLSLPLGLPVLGAPPRLLICDSRVLEERYLLEAKEENITGCAEH 59  
 DB 1 MGVHCPAFLML-LLSLSLPLGLPVLGAPPRLLICDSRVLEERYLLEAKEENITGCAEH 60  
 QY 60 CSLNENITVPDTKVFYAMKRNKXSOQAVEWOGIALLSAVIRGQALLVNSSOPPEPDL 119  
 DB 61 CSLNENITVPDTKVFYAMKRNKMEVQOQAMEVWOGIALLSAVIRGQALLVNSSOPPEPDL 120  
 QY 120 LHVDAVSGLSRLSTLLRALGAQKEAISPPDA--SAAPLRTTADTFKRLFFVYSNFLNG 178  
 DB 121 LHVDAVSGLSRLSTLLRALGAQKEAISPPDA--SAAPLRTTADTFKRLFFVYSNFLNG 180  
 QY 179 KLKLYTGEACRTGDR 193  
 DB 181 KLKLYTGEACRRDR 195

## RESULT 3

QY 09GKA2 PRELIMINARY; PRT; 195 AA.  
 AC 09GKA2;  
 DT 01-MAR-2001 (TREMBlrel. 16, Created)  
 DT 01-MAR-2001 (TREMBlrel. 16, Last sequence update)  
 DT 01-JUN-2002 (TREMBlrel. 21, Last annotation update)  
 DE Erythropoietin.  
 OS Oryctolagus cuniculus (Rabbit).

OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  
 OC Mammalia; Eutheria; Lagomorpha; Leporidae; Oryctolagus.  
 NCBI\_TaxID=9986;  
 RN [1]  
 RP SEQUENCE FROM N.A.  
 RX MEDLINE=21290682; PubMed=11396976;  
 RA Vilalta A., Wu D., Margalith M., Hobart P.;  
 RT "Rabbit Epo Gene and cDNA: Expression of Rabbit Epo after  
 RL Intramuscular Injection of pDNA."  
 RT Biochem. Biophys. Res. Commun. 284:823-827(2001).  
 DR EMBL: AF290944; AAG36962.1; -.  
 DR HSSP: P01588; ICN4.  
 DR InterPro: IPR001323; EPO\_TPO.  
 DR InterPro: IPR003013; Erythroptn.  
 DR Pfam: PF00758; EPO\_TPO; 1.  
 DR PRINTS: PR00272; ERYTHROPTN.  
 DR PROSITE: PS00817; EPO\_TPO; 1.  
 SQ SEQUENCE 195 AA; 21025 MW; 1F1DC7F403A303EC CRC64;

Query Match 73.3%; Score 726.5; DB 6; Length 195;  
 Best Local Similarity 80.2%; Pred. No. 7.1e-62;

Matches 146; Conservative 14; Mismatches 21; Indels 1; Gaps 1;

QY 13 LLSLSPLGLPVLGAPPRLLICDSRVLEERYLLEAKEENITGCAEHCSLNENITVPDTK 72  
 DB 14 LLSLSPLGLPVLGAPPRLLICDSRVLEERYLLEAKEENITGCAEHCSLNENITVPDTK 73  
 QY 73 VNFYAMKRNKXSOQAVEWOGIALLSAVIRGQALLVNSSOPPEPDLQHYDKAVSGLSRL 132  
 DB 74 VNFYAMKRNKXSOQAVEWOGIALLSAVIRGQALLVNSSOPPEPDLQHYDKAVSGLSRL 133  
 QY 133 TLLRALGAQKEAISPPDA--SAAPLRTTADTFKRLFFVYSNFLGRLKLYTGEACRTG 191  
 DB 134 TLLRALGAQKEAISPPDA--SAAPLRTTADTFKRLFFVYSNFLGRLKLYTGEACRTG 193  
 QY 192 DR 193  
 DB 194 DR 195

## RESULT 4

QY 08H288 PRELIMINARY; PRT; 133 AA.  
 AC 08H288;  
 DT 01-MAR-2003 (TREMBlrel. 23, Created)  
 DT 01-MAR-2003 (TREMBlrel. 23, Last sequence update)  
 DT 01-MAR-2003 (TREMBlrel. 23, Last annotation update)  
 DE Erythropoietin (Fragment).  
 OS Gorilla gorilla (gorilla).  
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  
 OC Mammalia; Eutheria; Primates; Catarrhini; Homiidae; Gorilla.  
 NCBI\_TaxID=9593;  
 RN [1]  
 RP SEQUENCE FROM N.A.  
 RA O'halligan C., Tichy H., Klein J.;  
 RT "Molecular evolution in higher primates: gene specific and organism  
 RT specific characteristics."  
 RT Submitted (MAR-2002) to the EMBL/Genbank/DBJ databases.  
 DR EMBL: AY092016; AAM76633.1; -.  
 FT NON\_TER 1  
 FT NON\_TER 133  
 SQ SEQUENCE 133 AA; 14696 MW; E2D0130942693140 CRC64;

Query Match 65.1%; Score 645; DB 6; Length 133;  
 Best Local Similarity 97.0%; Pred. No. 3e-54;

Matches 129; Conservative 0; Mismatches 4; Indels 0; Gaps 0;

QY 36 SRVLEERYLLEAKEENITGCAEHCSLNENITVPDTKVFYAMKRNKXSOQAVEWOGIA 95  
 DB 1 SRVLEERYLLEAKEENITGCAEHCSLNENITVPDTKVFYAMKRNKMEVQOQAVEWOGIA 60  
 QY 96 LLSAVIRGQALLVNSSOPPEPDLQHYDKAVSGLSRLTLLRALGAQKEAISPPDAASAA 155

Db 61 L1SEAVLRGQALLVNSSQPEPQLQHVDAVSGRLSTLLRLALGAQKEAISPDDAASAA 120

QY 156 PLRTITADTFRKL 168  
Db 121 PLRTITADTFRKL 133

## RESULT 5

QY 08H289 PRELIMINARY; PRT: 133 AA.  
AC 08H289;  
DT 01-MAR-2003 (TReMBLrel. 23, Created)  
DT 01-MAR-2003 (TReMBLrel. 23, Last sequence update)  
DT 01-MAR-2003 (TReMBLrel. 23, Last annotation update)  
DE Erythropoietin (Fragment).  
OS Pan troglodytes (Chimpanzee).  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  
OC Mammalia; Eutheria; Primates; Catarrhini; Homiidae; Pan.  
OX NCBI\_TaxId=9598;  
RN [1]  
RP SEQUENCE FROM N.A.  
RA O'hugin C., Tichy H., Klein J.;  
RT "Molecular evolution in higher primates; gene specific and organism  
specific characteristics.";  
RL Submitted (MAR-2002) to the EMBL/GenBank/DBJ databases.  
DR EMBL: AY092015; AAM76632.1; -.  
FT NON\_TER 1  
FT NON\_TER 133  
SQ SEQUENCE 133 AA; 14523 MW; ECDF5609596390EB CRC64;

Query Match 63.8%; Score 632; DB 6; Length 133;  
Best Local Similarity 96.2%; Pred. No. 5.3e-53;  
Matches 128; Conservative 0; Mismatches 5; Indels 0; Gaps 0;

QY 36 SRVLERYLLEAKAEENITTCGAHCSSLNENITVPDTRKVNFRYAKRKXSOQAVEVWQGLA 95  
Db 1 SRVLERYLLEAKAEENITTCGAHCSSLNENITVPDTRKVNFRYAKRKMEVGQAVEVWQGLA 60

QY 96 L1SEAVLRGQALLVNSSQPEPQLQHVDAVSGRLSTLLRLALGAQKEAISPDDAASAA 155  
Db 61 L1SEAVLRGQALLVNSSQPEPQLQHVDAVSGRLSTLLRLALGAQKEAISPDDAASAA 120

QY 156 PLRTITADTFRKL 168  
Db 121 PLRTITADTFRKL 133

## RESULT 6

QY 08H287 PRELIMINARY; PRT: 131 AA.  
AC 08H287;  
DT 01-MAR-2003 (TReMBLrel. 23, Created)  
DT 01-MAR-2003 (TReMBLrel. 23, Last sequence update)  
DT 01-MAR-2003 (TReMBLrel. 23, Last annotation update)  
DE Erythropoietin (Fragment).  
OS Pongo pygmaeus (Orangutan).  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  
OC Mammalia; Eutheria; Primates; Catarrhini; Homiidae; Pongo.  
OX NCBI\_TaxId=9600;  
RN [1]  
RP SEQUENCE FROM N.A.  
RA O'hugin C., Tichy H., Klein J.;  
RT "Molecular evolution in higher primates; gene specific and organism  
specific characteristics.";  
RL Submitted (MAR-2002) to the EMBL/GenBank/DBJ databases.  
DR EMBL: AY092017; AAM76634.1; -.  
FT NON\_TER 1  
FT NON\_TER 131  
SQ SEQUENCE 131 AA; 14403 MW; 143F5E4931EA03FA CRC64;

Query Match 60.6%; Score 601; DB 6; Length 131;  
Best Local Similarity 92.4%; Pred. No. 5e-50;  
Matches 122; Conservative 2; Mismatches 6; Indels 2; Gaps 1;

QY 36 SRVLERYLLEAKAEENITTCGAHCSSLNENITVPDTRKVNFRYAKRKXSOQAVEVWQGLA 95  
Db 1 SRVLERYLLEAKAEENITTCGAHCSSLNENITVPDTRKVNFRYAKRKMEVGQAVEVWQGLA 58

QY 96 L1SEAVLRGQALLVNSSQPEPQLQHVDAVSGRLSTLLRLALGAQKEAISPDDAASAA 155  
Db 59 L1SEAVLRGQALLVNSSQPEPQLQHVDAVSGRLSTLLRLALGAQKEAISPDDAALAA 118

QY 156 PLRTITADTFRKL 167  
Db 119 PLRTITADTFRKL 130

## RESULT 7

QY 08H286 PRELIMINARY; PRT: 133 AA.  
AC 08H286;  
DT 01-MAR-2003 (TReMBLrel. 23, Created)  
DT 01-MAR-2003 (TReMBLrel. 23, Last sequence update)  
DT 01-MAR-2003 (TReMBLrel. 23, Last annotation update)  
DE Erythropoietin (Fragment).  
OS Macaca sp.  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  
OC Mammalia; Eutheria; Primates; Catarrhini; Cercopithecoidea;  
OC Cercopithecoidea; Macaca.  
OX NCBI\_TaxId=9549;  
RN [1]  
RP SEQUENCE FROM N.A.  
RA O'hugin C., Tichy H., Klein J.;  
RT "Molecular evolution in higher primates; gene specific and organism  
specific characteristics.";  
RL Submitted (MAR-2002) to the EMBL/GenBank/DBJ databases.  
DR EMBL: AY092018; AAM76635.1; -.  
FT NON\_TER 1  
FT NON\_TER 133  
SQ SEQUENCE 133 AA; 14506 MW; 55CB11A2DC8354A0 CRC64;

Query Match 58.6%; Score 581; DB 6; Length 133;  
Best Local Similarity 87.2%; Pred. No. 4.2e-48;  
Matches 116; Conservative 8; Mismatches 9; Indels 0; Gaps 0;

QY 36 SRVLERYLLEAKAEENITTCGAHCSSLNENITVPDTRKVNFRYAKRKXSOQAVEVWQGLA 95  
Db 1 SRVLERYLLEAKAEENITTCGAHCSSLNENITVPDTRKVNFRYAKRKMEVGQAVEVWQGLA 60

QY 96 L1SEAVLRGQALLVNSSQPEPQLQHVDAVSGRLSTLLRLALGAQKEAISPDDAASAA 155  
Db 61 L1SEAVLRGQALLVNSSQPEPQLQHVDAVSGRLSTLLRLALGAQKEAISPDDAASAA 120

QY 156 PLRTITADTFRKL 168  
Db 121 PLRTITADTFRKL 133

## RESULT 8

QY 08H285 PRELIMINARY; PRT: 133 AA.  
AC 08H285;  
DT 01-MAR-2003 (TReMBLrel. 23, Created)  
DT 01-MAR-2003 (TReMBLrel. 23, Last sequence update)  
DT 01-MAR-2003 (TReMBLrel. 23, Last annotation update)  
DE Erythropoietin (Fragment).  
OS Saguinus oedipus (Colton-top tamarin).  
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  
OC Mammalia; Eutheria; Primates; Platyrrhini; Callitrichidae; Saguinus.  
OX NCBI\_TaxId=9490;  
RN [1]  
RP SEQUENCE FROM N.A.  
RA O'hugin C., Tichy H., Klein J.;  
RT "Molecular evolution in higher primates; gene specific and organism  
specific characteristics.";  
RL Submitted (MAR-2002) to the EMBL/GenBank/DBJ databases.

DR EMBL: AY092019; AAM76636.1; -  
 FT NON\_TER 1  
 RT 133  
 SQ SEQUENCE 133 AA; 14375 MW; C923E859BB08FEC CRC64;

Query Match  
 Best Local Similarity 53.8%; Score 533; DB 6; Length 133;  
 Pred. No. 1.7e-43;  
 Matches 110; Conservative 8; Mismatches 14; Indels 2; Gaps 2;

OY 36 SVLERYLLLEAKENITTCGAHCSLNENITVPDTKVFYAKRKXSOQAVVWQGLA 95  
 DB 1 SCVLERYVLEGEAEVNTGCAHCSLNENITVPDTKVFYAKRKXSOQAVVWQGLT 60  
 OY 96 LUSEAVLRQALLVNSQWPEPLQHVDAVSGLSLTTLRLALGAQKEAISPPDAA-SA 154  
 DB 61 LUSEAVLRQALLVNSQWPEPLQHVDAVSGLSLTTLRLALGAQKEAISPPDAA-SA 119  
 OY 155 APLRTITADTFKKL 168  
 DB 120 VPLQTTTADTFSKL 133

## RESULT 9

OQ9V40 PRELIMINARY; PRT; 50 AA.  
 DT 01-MAY-2000 (TREMBlrel. 13, Created)  
 DT 01-MAY-2000 (TREMBlrel. 13, Last sequence update)  
 DT 01-JUN-2002 (TREMBlrel. 21, Last annotation update)  
 DE Erythropoietin (Fragment).  
 OS Rattus sp.  
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  
 OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Rattus.  
 NCBI\_TaxID=10118;  
 RN [1]  
 RP SEQUENCE.  
 RX MEDLINE=94115047; PubMed=7764337;  
 RA Okano M., Suga H., Masuda S., Nagao M., Narita H., Ikura K.,  
 RL Sasaki R.;  
 RL Biosci. Biotechnol. Biochem. 57:1882-1885(1993).  
 DR HSSP: P01588; 1EER.  
 DR InterPro: IPR001323; EPO.TPO.  
 DR InterPro: IPR003013; Erythropo.  
 DR Pfam: PF00758; EPO.TPO; 1.  
 DR PRINTS: PR00272; ERYTHROPTN.  
 SQ SEQUENCE 50 AA; 5587 MW; 70B44A8BFE016034 CRC64;

Query Match  
 Best Local Similarity 19.0%; Score 188; DB 11; Length 50;  
 Pred. No. 7.4e-11;  
 Matches 39; Conservative 3; Mismatches 8; Indels 0; Gaps 0;

OY 28 APRRLICSRVLERYLLLEAKENITTCGAHCSLNENITVPDTKVFY 77  
 DB 1 APRRLICSRVLERYLLLEAKENITTCGAHCSLNENITVPDTKVFY 50

## RESULT 10

OQ9PH5 PRELIMINARY; PRT; 554 AA.  
 DT 01-MAY-2000 (TREMBlrel. 13, Created)  
 DT 01-MAY-2000 (TREMBlrel. 13, Last sequence update)  
 DT 01-MAR-2003 (TREMBlrel. 23, Last annotation update)  
 DE Recd.  
 GN RECD.  
 OS Mycobacterium smegmatis.  
 OC Bacteria; Actinobacteria; Actinobacteridae; Actinomycetales;  
 OC Corynebacteriaceae; Mycobacteriaceae; Mycobacterium.  
 NCBI\_TaxID=1772;  
 RN [1]  
 RP SEQUENCE FROM N.A.  
 RC STRAIN=mc2155;  
 RX MEDLINE=9412429; PubMed=10481025;

RA Griffin IV T.J., Parsons L., Leschziner A.E., Devost J.,  
 RA Derbyshire K.M., Grindley N.D.;  
 RT "In vitro transposition of tn552: a tool for DNA sequencing and  
 mutagenesis.";  
 RL Nucleic Acids Res. 27:3859-3865(1999).  
 DR EMBL: AF157643; AAD46809.1; -  
 DR InterPro: IPR003593; AAA\_Arpase.  
 DR InterPro: IPR006344; Recd.  
 DR InterPro: IPR006066; Viral\_helicase1.  
 DR Pfam: PF01443; Viral\_helicase1.  
 DR SMART: SM00382; AAA; 1.  
 DR TIGRfams: TIGR01447; Recd; 1.  
 KW ATP-binding.  
 SQ SEQUENCE 554 AA; 59516 MW; 3947B550498B62C CRC64;

Query Match  
 Best Local Similarity 9.7%; Score 96.5; DB 2; Length 554;  
 Pred. No. 0.9;  
 Matches 50; Conservative 19; Mismatches 57; Indels 61; Gaps 9;

OY 8 AMLWLLSLSLPLGLPVLGAPP--RLICDSRVLERYLLLEAKENITTCGAHCSL--- 62  
 DB 72 AMLAALAA-----SPLLGPPVLRLLFGDLLYLRVWLEFGQV-----CDVLALVSA 118  
 OY 63 NENITVPDTKVFYAKRKXSOQAVVWQGLALSE-----AVLQGLL 108  
 DB 119 RCGAVPDVSRLLGAGFEEDRAAKAVALSQGLVLTGPGTGKTTVARLLALAEQAL 178  
 OY 109 VNSQWPEPLQHVDAVSGLSLTTLRLALGAQKEAI 146  
 DB 179 ACKPSRILAPPTGKAARLQEAVALLEIDQDLIERRLTDLHA-TTLRLILGR----- 233

## RESULT 11

OQ9EOR6 PRELIMINARY; PRT; 623 AA.  
 DT 01-MAR-2001 (TREMBlrel. 16, Created)  
 DT 01-MAR-2001 (TREMBlrel. 16, Last sequence update)  
 DT 01-MAR-2003 (TREMBlrel. 23, Last annotation update)  
 DE Fanconi anemia group G protein (fanconi anemia complementation group G).  
 GN FANCG.  
 OS Mus musculus (Mouse).  
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  
 OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.  
 NCBI\_TaxID=10090;  
 RN [1]  
 RP SEQUENCE FROM N.A.  
 RA Tipping A.J., Morgan N.V., Mathew C.G.;  
 RT "Sequencing and genomic structure of fangc, the murine orthologue of  
 the Fanconi anemia group G gene (FANCG).";  
 RT Submitted (DEC-1998) to the EMBL/Genbank/DBJ databases.  
 RL Submitted (DEC-1998) to the EMBL/Genbank/DBJ databases.  
 RN [2]  
 RP SEQUENCE FROM N.A.  
 RC STRAIN=FVB;  
 RA van der Vugt H.J., Koomen M., Berns M.A.B., de Vries Y.,  
 RA Roelmans M.A., van der Weel L., Blom E., de Winter J.P., de Groot J.,  
 RA Schepers R.J., Hoatlin M.E., Ching Cheng N., Joenje H., Arwert F.;  
 RT "Characterization, expression and complex formation of murine fangc.";  
 RL Submitted (AUG-2001) to the EMBL/Genbank/DBJ databases.  
 DR EMBL: AF112439; AAG43198.1; -  
 DR EMBL: AY049715; AAL12165.1; -  
 DR MGI: 1926471; Fancg.  
 DR InterPro: IPR001440; TPR.  
 DR Pfam: PF00515; TPR; 2.  
 SQ SEQUENCE 623 AA; 68505 MW; 061586EF186F74AF CRC64;

Query Match  
 Best Local Similarity 9.1%; Score 90; DB 11; Length 623;  
 Pred. No. 4.4;





GenCore version 5.1.6  
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OM protein - protein search, using sw model

Run on: September 8, 2003, 14:35:11; Search time 17 Seconds

(without alignments)  
533.891 Million cell updates/sec

Title: US-09-813-775c-34

Sequence: 1 MGVHCPAMVLLSLSLP.....NFLRGLKLYTGACRTGDR 193

Scoring table:

BLOSUM62  
Gapop 10.0, Gapext 0.5

Searched: 127863 seqs, 47026705 residues

Total number of hits satisfying chosen parameters: 127863

Minimum DB seq length: 0

Maximum DB seq length: 200000000

Post-processing: Minimum Match 0%

Maximum Match 100%

Listing first 45 summaries

Database: SwissProt\_41.\*

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

# SUMMARIES

Result No.	Score	Query Match	Length	ID	Description
1	97.3	98.2	193	1	EPO_HUMAN
2	881.5	89.0	192	1	EPO_MACFA
3	879.5	88.7	192	1	EPO_MACMU
4	778.5	78.6	192	1	EPO_FELCA
5	762.5	76.9	192	1	EPO_RAT
6	752.5	75.9	194	1	EPO_SHEEP
7	748.5	75.5	190	1	EPO_PIG
8	746.5	75.3	192	1	EPO_MOUSE
9	740.5	74.7	192	1	EPO_BOVIN
10	699.5	70.6	175	1	EPO_CANFA
11	122.5	12.4	352	1	TPO_CANFA
12	98.5	9.9	353	1	TPO_HUMAN
13	91	9.2	356	1	TPO_MOUSE
14	87.5	8.8	326	1	TPO_RAT
15	86.5	8.7	622	1	FACG_MOUSE
16	84	8.5	339	1	MURB_PSEAE
17	80	8.1	353	1	NADA_YERPE
18	80	8.1	1980	1	MYB_RAT
19	79	8.0	1089	1	IMB3_YEAST
20	76.5	7.7	381	1	APA_MYCAV
21	76.5	7.7	543	1	CH60_BARBA
22	76	7.6	552	1	CH60_COXBU
23	75	7.6	263	1	YH25_DEIRA
24	75	7.6	778	1	RG12_MOUSE
25	74.5	7.5	475	1	Z342_HUMAN
26	74.5	7.5	3033	1	POIG_HCVJ8
27	73.5	7.4	388	1	TBA6_BURCE
28	73.5	7.4	897	1	EP15_MOUSE
29	72.5	7.3	347	1	NADA_SALTI
30	71.5	7.2	220	1	Y085_MYCTU
31	71.5	7.2	283	1	AROE_XANAC
32	71.5	7.2	486	1	BAF1_KIULA
33	71.5	7.2	907	1	GACS_PSESY

34	71.5	7.2	3164	1	TEGU_HSV11
35	71	7.2	224	1	MERI_HUMAN
36	71	7.2	342	1	TORT_ECO57
37	71	7.2	342	1	TORT_ECOLI
38	71	7.2	402	1	YCB_BACSU
39	71	7.2	547	1	G6P2_NEIMA
40	71	7.2	926	1	ATCL_SYN7
41	70.5	7.1	279	1	LEP4_ERMCA
42	70.5	7.1	283	1	AROE_XANCP
43	70.5	7.1	1402	1	N160_MOUSE
44	70	7.1	347	1	NADA_SALTY
45	70	7.1	473	1	RTAR_HUMAN

## ALIGNMENTS

RESULT 1	ID	EPO_HUMAN	STANDARD:	PRT:	193 AA.
AC	P01588	Q9UD20; Q9UE25; Q9UHA0;			
DT	21-JUL-1986	(Rel. 01, Created)			
DT	21-JUL-1986	(Rel. 01, Last sequence update)			
DT	15-SEP-2003	(Rel. 42, Last annotation update)			
DE	Erythropoietin precursor (Epoetin).				
GN	EPO.				
OS	Homo sapiens (Human).				
OC	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;				
OC	Mammalia; Eutheria; Primates; Catarrhini; Homiidae; Homo.				
NCBI	TaxID=9606;				
RN	[1]				
RP	SEQUENCE FROM N.A.				
RX	MEDLINE=85137899; PubMed=3838366;				
RA	Jacobs K., Shoemaker C., Ruderstorf R., Neill S.D., Kaufman R.J.,				
RA	Mufson A., Seehra J., Jones S.S., Hewick R., Fritsch E.F.,				
RA	Kawakita M., Shimizu T., Miyake T.;				
RT	"Isolation and characterization of genomic and cDNA clones of human				
RT	erythropoietin.";				
RL	Nature 313:806-810(1985).				
RN	[2]				
RP	SEQUENCE FROM N.A.				
RX	MEDLINE=86067948; PubMed=3865178;				
RA	Lin F.-K., Suggs S., Lin C.-H., Browne J.K., Smalling R., Egrie J.C.,				
RA	Chen K.K., Fox G.M., Martin F., Stabinsky Z., Badrawi S.M., Lai P.-H.,				
RA	Goldwasser E.;				
RT	"Cloning and expression of the human erythropoietin gene.";				
RT	Proc. Natl. Acad. Sci. U.S.A. 82:7580-7584(1985).				
RN	[3]				
RP	SEQUENCE FROM N.A.				
RX	MEDLINE=99018118; PubMed=9799793;				
RA	Gloekner G., Scherer S., Schattevoy R., Boright A.P., Weber J.,				
RA	Tsui L.-C., Rosenthal A.;				
RT	"Large-scale sequencing of two regions in human chromosome 7q22:				
RT	analysis of 650 kb of genomic sequence around the EPO and CMT1 loci				
RT	reveals 17 genes.";				
RL	Genome Res. 8:1060-1073(1998).				
RN	[4]				
RP	SEQUENCE FROM N.A.				
RA	Rupert J.L., Hochachka P.W.;				
RT	"Erythropoietin gene sequence in the Quechua, a high altitude native				
RT	population.";				
RT	Submitted (NOV-1999) to the EMBL/GenBank/DBJ databases.				
RN	[5]				
RP	SEQUENCE OF 58-193 FROM N.A., AND VARIANTS HEPATOCELLULAR CARCINOMA				
RP	131-ASN-PHE-137 AND GLN-149.				
RX	MEDLINE=93384593; PubMed=8396923;				
RA	Funakoshi A., Muta H., Baba T., Shimizu S.;				
RT	"Gene expression of mutant erythropoietin in hepatocellular				
RT	carcinoma.";				
RL	Biochem. Biophys. Res. Commun. 195:717-722(1993).				
RN	[6]				
RP	SEQUENCE OF 28-193, AND DISULFIDE BONDS.				
RP	TISSUE=Urine;				

RA RX MEDLINE=86140080; PubMed=3949763.  
RA Lai P.H., Everett R., Wang F.F., Arkawa T., Goldwasser E.;  
RT "Structural characterization of human erythropoietin.";  
RL J. Biol. Chem. 261:3116-3121(1986).  
RN [7]  
RN PRELIMINARY SEQUENCE OF 28-57.  
RP MEDLINE=84135751; PubMed=6698989;  
RX Yanagawa S., Hirade K., Ohnoda H., Sasaki R., Chiba H., Ueda M.,  
RA Goto M.;  
RT "Isolation of human erythropoietin with monoclonal antibodies.";  
RL J. Biol. Chem. 259:2707-2710(1984).  
RN [8]  
RN STRUCTURE OF CARBOHYDRATES.  
RP MEDLINE=88153657; PubMed=3346214;  
RX Takeuchi M., Takasaki S., Miyazaki H., Kato T., Hoshi S., Kochibe N.,  
RA Kobata A.;  
RT "Comparative study of the asparagine-linked sugar chains of human  
RT erythropoietins purified from urine and the culture medium of  
RT recombinant Chinese hamster ovary cells.";  
RL J. Biol. Chem. 263:3657-3663(1988).  
RN [9]  
RN STRUCTURE OF CARBOHYDRATES.  
RP MEDLINE=89118279; PubMed=3219367;  
RX Sasaki H., Ochi N., Dell A., Fukuda M.;  
RA "Site-specific glycosylation of human recombinant erythropoietin:  
RT analysis of glycopeptides or peptides at each glycosylation site by  
RT fast atom bombardment mass spectrometry.";  
RL Biochemistry 27:8618-8626(1988).  
RN [10]  
RN STRUCTURE OF CARBOHYDRATES.  
RP MEDLINE=92314463; PubMed=1820196;  
RX Takeuchi M., Kobata A.;  
RA "Structures and functional roles of the sugar chains of human  
RT erythropoietins.";  
RL Glycobiology 1:337-346(1991).  
RN [11]  
RN X-RAY CRYSTALLOGRAPHY (1.9 ANGSTROMS).  
RP MEDLINE=98445092; PubMed=9774108.  
RX Syed R.S., Reid S.W., Li C., Cheetham J.C., Aoki K.H., Liu B.,  
RA Zhan H., Ostlund T.D., Chiriac A.J., Zhang J., Fliner-Moore J.,  
RA Elliott S., Sitrney K., Katz B.A., Matthews D.J., Wendoloski J.J.,  
RA Eggle J., Stroud R.M.;  
RT "Efficiency of signaling through cytokine receptors depends  
RT critically on receptor orientation.";  
RL Nature 395:511-516(1998).  
RL -1- FUNCTION: ERYTHROPOIETIN IS THE PRINCIPAL HORMONE INVOLVED IN THE  
CC REGULATION OF ERYTHROCYTE DIFFERENTIATION AND THE MAINTENANCE OF A  
CC PHYSIOLOGICAL LEVEL OF CIRCULATING ERYTHROCYTE MASS.  
CC -1- SUBCELLULAR LOCATION: Secreted.  
CC -1- TISSUE SPECIFICITY: PRODUCED BY KIDNEY OR LIVER OF ADULT MAMMALS  
CC AND BY LIVER OF FETAL OR NEONATAL MAMMALS.  
CC -1- PHARMACEUTICAL: Used for the treatment of anemia. Available under  
CC the names Epogen (Amgen), Epogin (Chugai), Epomax (Eliansx), Eprex  
CC (Janssen-Cilag), Neorecomon or Recormon (Roche), and Procrit  
CC (Ortho Biotech). Variations in the glycosylation pattern of Epo  
CC distinguishes these products. Epogen, Epogin, Eprex and Procrit  
CC are genetically known as epoetin alfa, Neorecomon and Recormon as  
CC epoetin beta and Epomax as epoetin omega.  
CC -1- SIMILARITY: BELONGS TO THE Epo / TPO FAMILY.  
CC -1- DATABASE: NAME=R&D Systems' cytokine source book: Epo;  
CC WWW="http://www.rndsystems.com/asp/sitebuilder.asp?bodyid=197".  
CC -----  
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CC -----  
DR EMBL: X02158; CAA26095.1; -  
DR EMBL: X02157; CAA26094.1; -  
DR EMBL: M11319; CAA52400.1; -

[illegible]



```

OY 61 SLNENTVDPDTKYNFYAMKRNXXSOQAVEWOGTALLSEAVLRGQALVNSSQPEPDLQ 120
    |||||||
DB 61 SLNENTVDPDTKYNFYAMKRMVEYGOQAVEWOGTALLSEAVLRGQALVNSSQPEPDLQ 120
OY 121 HDKAVSGLSRLTTLRALGAQKEAISPPDASAAPLRTTADTFPKLFRVYSNPLRGKL 180
    |||||||
DB 121 HDKAVSGLSRLTTLRALGAQKEAISPPDASAAPLRTTADTFPKLFRVYSNPLRGKL 180
OY 181 KLYTGACRTGDR 193
    |||||||
DB 181 KLYTGACRTGDR 193

RESULT 2
EPO_MACFA STANDARD: PRT: 192 AA.
ID EPO_MACFA P07865;
AC 01-AUG-1988 (Rel. 08, Created)
DT 01-AUG-1988 (Rel. 08, Last sequence update)
DT 16-OCT-2001 (Rel. 40, Last annotation update)
DE Erythropoietin precursor.
GN EPO.
OS Macaca fascicularis (Crab eating macaque) (Cynomolgus monkey).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Primates; Catarrhini; Cercopitheciidae;
OC Cercopitheciinae; Macaca.
OX NCBI_TaxID=9541;
RN [1]
RP SEQUENCE FROM N.A.
RX MEDLINE=87055236; PubMed=2877922;
RA Lin F.-K., Lin C.-H., Lai P.-H., Browne J.K., Egrie J.C., Smalling R.,
RA Fox G.M., Chen K.K., Castro M., Suggs S.;
RT "Monkey erythropoietin gene: cloning, expression and comparison with
RT the human erythropoietin gene.";
RL Gene 44:201-209(1986).
CC -1- FUNCTION: ERYTHROPOIETIN IS THE PRINCIPAL HORMONE INVOLVED IN THE
CC REGULATION OF ERYTHROCYTE DIFFERENTIATION AND THE MAINTENANCE OF A
CC PHYSIOLOGICAL LEVEL OF CIRCULATING ERYTHROCYTE MASS.
CC -1- SUBCELLULAR LOCATION: Secreted.
CC -1- TISSUE SPECIFICITY: PRODUCED BY KIDNEY OR LIVER OF ADULT MAMMALS
CC AND BY LIVER OF FETAL OR NEONATAL MAMMALS.
CC -1- SIMILARITY: BELONGS TO THE EPO / TPO FAMILY.
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CC or send an email to license@isb-sib.ch).
CC -----
CC EMBL: M18189; AAA36841.1; -
DR PIR: JQ0173; JQ0173.
DR HSSP: P01588; ICN4.
DR InterPro: IPR001323; EPO_TPO.
DR InterPro: IPR003013; Erythropn.
DR Pfam: PR00758; EPO_TPO; 1.
DR PRINTS: PR00272; ERYTHROPTN.
DR PROSITE: PS00817; EPO_TPO; 1.
DR Erythrocyte maturation; Glycoprotein; Hormone; Signal.
FT SIGNAL 1 27
FT CHAIN 28 192 BY SIMILARITY.
FT DISULFID 34 187 ERYTHROPOIETIN.
FT DISULFID 56 60 BY SIMILARITY.
FT CARBOHYD 51 51 N-LINKED (GLCNAC. . .) (BY SIMILARITY).
FT CARBOHYD 65 65 N-LINKED (GLCNAC. . .) (BY SIMILARITY).
FT CARBOHYD 110 110 N-LINKED (GLCNAC. . .) (BY SIMILARITY).
FT CARBOHYD 152 152 O-LINKED (GALNAC. . .) (BY SIMILARITY).
SO SEQUENCE 192 AA; 21113 MW; E8A900F442AD4522 CRC64;

Query Match 89.0%; Score 881.5; DB 1; Length 192;
Best Local Similarity 89.6%; Pred. No. 1.7e-76;

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Matches 173; Conservative 8; Mismatches 11; Indels 1; Gaps 1;
OY 1 MGVHECPAMLMILLSLSPGLGPIVIGAPRRLICDSRVLEFRLLEKKEAENITTCGAENC 60
    |||||||
DB 1 MGVHECPAMLMILLSLIVSLPLGLPVGAPRRLICDSRVLEFRLLEKKEAENITTCGSESC 60
OY 61 SLNENTVDPDTKYNFYAMKRNXXSOQAVEWOGTALLSEAVLRGQALVNSSQPEPDLQ 120
    |||||||
DB 61 SLNENTVDPDTKYNFYAMKRMVEYGOQAVEWOGTALLSEAVLRGQALVNSSQPEPDLQ 120
OY 121 HDKAVSGLSRLTTLRALGAQKEAISPPDASAAPLRTTADTFPKLFRVYSNPLRGKL 180
    |||||||
DB 121 HDKAVSGLSRLTTLRALGAQ-FAISLPDASAAAPLRTTADTFPKLFRVYSNPLRGKL 179
OY 181 KLYTGACRTGDR 193
    |||||||
DB 180 KLYTGACRTGDR 192

RESULT 3
EPO_MACMU STANDARD: PRT: 192 AA.
ID EPO_MACMU Q28513;
AC 01-NOV-1997 (Rel. 35, Created)
DT 01-NOV-1997 (Rel. 35, Last sequence update)
DT 16-OCT-2001 (Rel. 40, Last annotation update)
DE Erythropoietin precursor.
GN EPO.
OS Macaca mulatta (Rhesus macaque).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Primates; Catarrhini; Cercopitheciidae;
OC Cercopitheciinae; Macaca.
OX NCBI_TaxID=9544;
RN [1]
RP SEQUENCE FROM N.A.
RX MEDLINE=93372347; PubMed=8364201;
RA Wen D., Boissel J.P.R., Tracy T.E., Gruninger R.H., Mulcahy L.S.,
RA Czelusniak J., Goodman M., Bunn H.F.;
RT "Erythropoietin structure-function relationships: high degree of
RT sequence homology among mammals.";
RL Blood 82:1507-1516(1993).
CC -1- FUNCTION: ERYTHROPOIETIN IS THE PRINCIPAL HORMONE INVOLVED IN THE
CC REGULATION OF ERYTHROCYTE DIFFERENTIATION AND THE MAINTENANCE OF A
CC PHYSIOLOGICAL LEVEL OF CIRCULATING ERYTHROCYTE MASS.
CC -1- SUBCELLULAR LOCATION: Secreted.
CC -1- TISSUE SPECIFICITY: PRODUCED BY KIDNEY OR LIVER OF ADULT MAMMALS
CC AND BY LIVER OF FETAL OR NEONATAL MAMMALS.
CC -1- SIMILARITY: BELONGS TO THE EPO / TPO FAMILY.
CC -----
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CC or send an email to license@isb-sib.ch).
CC -----
CC EMBL: L10609; AAA36842.1; -
DR PIR: I84613; I84613.
DR HSSP: P01588; ICN4.
DR InterPro: IPR001323; EPO_TPO.
DR InterPro: IPR003013; Erythropn.
DR Pfam: PR00758; EPO_TPO; 1.
DR PRINTS: PR00272; ERYTHROPTN.
DR PROSITE: PS00817; EPO_TPO; 1.
DR Erythrocyte maturation; Glycoprotein; Hormone; Signal.
FT SIGNAL 1 27
FT CHAIN 28 192 BY SIMILARITY.
FT DISULFID 34 187 ERYTHROPOIETIN.
FT DISULFID 56 60 BY SIMILARITY.
FT CARBOHYD 51 51 N-LINKED (GLCNAC. . .) (BY SIMILARITY).
FT CARBOHYD 65 65 N-LINKED (GLCNAC. . .) (BY SIMILARITY).

```

FT CARBOHYD 110 110 N-LINKED (GLCNAC. . .) (BY SIMILARITY).  
 FT CARBOHYD 152 152 O-LINKED (GALNAC. . .) (BY SIMILARITY).  
 SQ SEQUENCE 192 AA: 21081 MW: 275560A264628CD1 CRC64;

Query Match 88.7%; Score 879.5; DB 1: Length 192;  
 Best Local Similarity 89.1%; Pred. No. 2.6e-76;  
 Matches 172; Conservative 9; Mismatches 11; Indels 1; Gaps 1;

QY 1 MGVHCPAMWLILSLPLGLPVGAPRLICDSRVLYERYLLEAKEENITTCGAEGC 60  
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 DB 1 MGVHCPAMWLILSLPLGLPVGAPRLICDSRVLYERYLLEAKEENITTCGAEGC 60  
 QY 61 SLNENITVPDTRVNFYAMKRNKXKXQOAVEVMOGLALLSEAVLRGQALLVNSSQPEPIQL 120  
 |||||  
 DB 61 SLNENITVPDTRVNFYAMKRNKXKXQOAVEVMOGLALLSEAVLRGQALLVNSSQPEPIQL 120  
 QY 121 HYDKAVSGRLSTLTLLRALGAQKEAISPPDASAAPLRTITADTRPKLFRRYSNPLRGKL 180  
 |||||  
 DB 121 HYDKAVSGRLSTLTLLRALGAQKEAISPPDASAAPLRTITADTRPKLFRRYSNPLRGKL 180  
 QY 181 KLYTGEACRTGDR 193  
 |||||  
 DB 180 KLYTGEACRTGDR 192

## RESULT 4

EPO\_FELCA STANDARD; PRT: 192 AA.

ID EPO\_FELCA  
 AC P33708;  
 DT 01-FEB-1994 (Rel. 28, Created)  
 DT 01-OCT-1996 (Rel. 34, Last sequence update)  
 DT 16-OCT-2001 (Rel. 40, Last annotation update)  
 DE Erythropoietin precursor.  
 GN EPO.

OS Felis silvestris catus (Cat).  
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  
 OC Mammalia; Eutheria; Carnivora; Fissipedia; Felidae; Felis.  
 NCBI\_TaxID=9685;

RN NCBI\_TaxID=9685;  
 RP SEQUENCE FROM N.A.  
 RC TISSUE=Kidney;  
 RA Goodman R.E., Bell R.G.;  
 RL Submitted (NOV-1993) to the EMBL/Genbank/DBJ databases.  
 RN [2]

RP SEQUENCE OF 5-192 FROM N.A.  
 RX MEDLINE=93372347; PubMed=8364201;  
 RA Wen D., Boissel J.P.R., Tracy T.E., Gruninger R.H., Mulcahy L.S.,  
 CZ Czelusniak J., Goodman M., Bunn H.F.;  
 RT "Erythropoietin structure-function relationships: high degree of  
 sequence homology among mammals";  
 RL Blood 82:1507-1516(1993).

-1- FUNCTION: ERYTHROPOIETIN IS THE PRINCIPAL HORMONE INVOLVED IN THE  
 REGULATION OF ERYTHROCYTE DIFFERENTIATION AND THE MAINTENANCE OF A  
 PHYSIOLOGICAL LEVEL OF CIRCULATING ERYTHROCYTE MASS.

-1- SUBCELLULAR LOCATION: Secreted.  
 -1- TISSUE SPECIFICITY: PRODUCED BY KIDNEY OR LIVER OF ADULT MAMMALS  
 AND BY LIVER OF FETAL OR NEONATAL MAMMALS.

-1- SIMILARITY: BELONGS TO THE EPO / TPO FAMILY.  
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DR EMBL: U00685; AAA18282.1; -  
 DR EMBL: L10606; AAA30807.1; -  
 DR PIR: I46083; I46083.  
 DR HSSP: P01588; ICM4.  
 DR InterPro: IPR001323; EPO\_TPO.  
 DR InterPro: IPR003013; Erythropo.

DR Pfam: PF00758; EPO\_TPO; 1.  
 DR PRINTS: PR00272; ERYTHROPTN.  
 DR PROSITE: PS00817; EPO\_TPO; 1.  
 KW Erythrocyte maturation; Glycoprotein; Hormone; Signal.

FT SIGNAL 1 26 BY SIMILARITY.  
 FT CHAIN 27 192 ERYTHROPOIETIN.  
 FT DISULFID 33 187 EY SIMILARITY.  
 FT DISULFID 55 59 BY SIMILARITY.  
 FT CARBOHYD 50 50 N-LINKED (GLCNAC. . .) (POTENTIAL).  
 FT CARBOHYD 64 64 N-LINKED (GLCNAC. . .) (POTENTIAL).  
 FT CARBOHYD 109 109 N-LINKED (GLCNAC. . .) (POTENTIAL).  
 FT CONFLICT 44 44 G -> E (IN REF. 2).  
 SQ SEQUENCE 192 AA: 20914 MW: 61C5EAF0F5E937293 CRC64;

Query Match 78.6%; Score 778.5; DB 1: Length 192;  
 Best Local Similarity 81.9%; Pred. No. 9.8e-67;  
 Matches 158; Conservative 8; Mismatches 26; Indels 1; Gaps 1;

QY 1 MGVHCPAMWLILSLPLGLPVGAPRLICDSRVLYERYLLEAKEENITTCGAEGC 60  
 |||||  
 DB 1 MGVHCPAMWLILSLPLGLPVGAPRLICDSRVLYERYLLEAKEENITTCGAEGC 59  
 QY 61 SLNENITVPDTRVNFYAMKRNKXKXQOAVEVMOGLALLSEAVLRGQALLVNSSQPEPIQL 120  
 |||||  
 DB 61 SLNENITVPDTRVNFYAMKRNKXKXQOAVEVMOGLALLSEAVLRGQALLVNSSQPEPIQL 119  
 QY 121 HYDKAVSGRLSTLTLLRALGAQKEAISPPDASAAPLRTITADTRPKLFRRYSNPLRGKL 180  
 |||||  
 DB 121 HYDKAVSGRLSTLTLLRALGAQKEAISPPDASAAPLRTITADTRPKLFRRYSNPLRGKL 179  
 QY 181 KLYTGEACRTGDR 193  
 |||||  
 DB 180 KLYTGEACRTGDR 192

## RESULT 5

EPO\_RAT STANDARD; PRT: 192 AA.

ID EPO\_RAT  
 AC P29676; P70504;  
 DT 01-APR-1993 (Rel. 25, Created)  
 DT 01-APR-1993 (Rel. 25, Last sequence update)  
 DT 16-OCT-2001 (Rel. 40, Last annotation update)  
 DE Erythropoietin precursor.  
 GN EPO.

OS Rattus norvegicus (Rat).  
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  
 OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Rattus.  
 NCBI\_TaxID=10116;

RN NCBI\_TaxID=10116;  
 RP SEQUENCE FROM N.A.  
 RC STRAIN=WiStar; TISSUE=Kidney;  
 RX MEDLINE=93042015; PubMed=1420369;  
 RA Nagao M., Suga H., Okano M., Masuda S., Narita H., Ikura K.,  
 SA Sasaki R.;  
 RT "Nucleotide sequence of rat erythropoietin";  
 RL Biochim. Biophys. Acta 1171:99-102(1992).  
 RN [2]

RP SEQUENCE OF 4-192 FROM N.A.  
 RX STRAIN=Sprague-Dawley; TISSUE=Kidney;  
 RX MEDLINE=93372347; PubMed=8364201;  
 RA Wen D., Boissel J.P.R., Tracy T.E., Mulcahy L.S., Czelusniak J.,  
 CZ Goodman M., Bunn H.F.;  
 RT "Erythropoietin structure-function relationships: high degree of  
 sequence homology among mammals";  
 RL Blood 82:1507-1516(1993).

-1- FUNCTION: ERYTHROPOIETIN IS THE PRINCIPAL HORMONE INVOLVED IN THE  
 PHYSIOLOGICAL LEVEL OF CIRCULATING ERYTHROCYTE MASS.

-1- SUBCELLULAR LOCATION: Secreted.  
 -1- TISSUE SPECIFICITY: PRODUCED BY KIDNEY OR LIVER OF ADULT MAMMALS  
 AND BY LIVER OF FETAL OR NEONATAL MAMMALS.  
 -1- SIMILARITY: BELONGS TO THE EPO / TPO FAMILY.  
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DR EMBL: D10763; BAA01593.1; -  
 DR EMBL: L10608; AAA41126.1; -  
 DR PIR: S28148; S28148.  
 DR HSSP: P01588; ICN4.  
 DR InterPro: IPR001323; EPO\_TPO.  
 DR InterPro: IPR003013; Erythroptn.  
 DR Pfam: PF00758; EPO\_TPO: 1.  
 DR PRINTS: PR00272; ERYTHROPTN.  
 DR PROSITE: PS00817; EPO\_TPO: 1.  
 KW Erythrocyte maturation; Glycoprotein; Hormone; Signal.  
 FT SIGNAL 1 26 BY SIMILARITY.  
 FT CHAIN 27 192 ERYTHROPOIETIN.  
 FT DISULFID 33 187 BY SIMILARITY.  
 FT CARBOHYD 50 50 N-LINKED (GLCNAC. . .) (BY SIMILARITY).  
 FT CARBOHYD 64 64 N-LINKED (GLCNAC. . .) (BY SIMILARITY).  
 FT CARBOHYD 109 109 N-LINKED (GLCNAC. . .) (BY SIMILARITY).  
 SQ SEQUENCE 192 AA; 21286 MW; 3EA632737E7D2443 CRC64;

Query Match 76.9%; Score 762.5; DB 1; Length 192;  
 Best Local Similarity 79.8%; Pred. No. 3.2e-65;  
 Matches 154; Conservative 13; Mismatches 25; Indels 1; Gaps 1;

QY 1 MGVEHCPAMWMLLSLPLGLVGLGAPRLICDSRVLEERYLLLEAKENITTCGAHC 60  
 DB 1 MGVEHCPAMWMLLSLPLGLVGLGAPRLICDSRVLEERYLLLEAKENITTCGAHC 59

QY 61 SLNENITVPPTKYNFAFKRNKXSOQAVEWQGLALSEVLRGQALLVNSSQPPWEPLQ 120  
 DB 60 RISENITVPPTKYNFAFKRNKXSOQAVEWQGLALSEVLRGQALLVNSSQPPWEPLQ 119

QY 121 HVDKAVSGRLSLTLTLRALGAQKEAISPPDAASAPLRTTADTPFKLFVYSNFKRL 180  
 DB 120 HVDKAVSGRLSLTLTLRALGAQKEAISPPDAASAPLRTTADTPFKLFVYSNFKRL 179

QY 181 KLYTGEACRTGDR 193  
 DB 180 KLYTGEACRTGDR 192

RESULT 6  
 EPO\_SHEEP  
 ID EPO\_SHEEP STANDARD; PRT; 194 AA.  
 AC P33709; Q28572;  
 DT 01-FEB-1994 (Rel. 28, Created)  
 DT 01-FEB-1994 (Rel. 28, Last sequence update)  
 DT 16-OCT-2001 (Rel. 40, Last annotation update)  
 DE Erythropoietin precursor.  
 GN EPO.  
 OS Ovis aries (Sheep).  
 OC Eukaryota; Metazoa; Chordata; Cranialia; Vertebrata; Euteleostomi;  
 OC Mammalia; Eutheria; Cetartiodactyla; Ruminantia; Pecora; Bovidae;  
 OC Bovidae; Caprinae; Ovis.  
 OC NCBI\_TaxID=9940;  
 RN NCBI\_TaxID=9940;  
 RP SEQUENCE FROM N.A.  
 RC TISSUE-Kidney;  
 RX MEDLINE=93372347; PubMed=8349021;  
 RA Fu P., Evans B., Lim G.B., Moritz K., Wintour M.E.;  
 RT "The sheep erythropoietin gene: molecular cloning and effect of  
 RT hemorrhage on plasma erythropoietin and renal/liver messenger RNA in  
 RT adult sheep.";  
 RL Mol. Cell. Endocrinol. 93:107-116(1993).  
 RN SEQUENCE OF 4-194 FROM N.A.  
 RC TISSUE-Kidney;  
 GN

RX MEDLINE=93372347; PubMed=8349021;  
 RA Wen D., Boissel J.P.R., Tracy T.E., Gruninger R.H., Mulcahy L.S.,  
 RA Celisnajak J., Goodman M., Bunn H.F.;  
 RT "Erythropoietin structure-function relationships: high degree of  
 RT sequence homology among mammals.";  
 RL Blood 82:1507-1516(1993).  
 CC - FUNCTION: ERYTHROPOIETIN IS THE PRINCIPAL HORMONE INVOLVED IN THE  
 CC REGULATION OF ERYTHROCYTE DIFFERENTIATION AND THE MAINTENANCE OF A  
 CC PHYSIOLOGICAL LEVEL OF CIRCULATING ERYTHROCYTE MASS.  
 CC - SUBCELLULAR LOCATION: Secreted.  
 CC - TISSUE SPECIFICITY: PRODUCED BY KIDNEY OR LIVER OF ADULT MAMMALS  
 CC AND BY LIVER OF FETAL OR NEONATAL MAMMALS.  
 CC - SIMILARITY: BELONGS TO THE EPO / TPO FAMILY.  
 CC  
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DR EMBL: Z24681; CAAB0848.1; -  
 DR EMBL: L10610; AAA31518.1; -  
 DR PIR: I46401; I46401.  
 DR HSSP: P01588; ICN4.  
 DR InterPro: IPR001323; EPO\_TPO.  
 DR InterPro: IPR003013; Erythroptn.  
 DR Pfam: PF00758; EPO\_TPO: 1.  
 DR PRINTS: PS00817; EPO\_TPO: 1.  
 KW Erythrocyte maturation; Glycoprotein; Hormone; Signal.  
 FT SIGNAL 1 27 BY SIMILARITY.  
 FT CHAIN 28 194 ERYTHROPOIETIN.  
 FT DISULFID 34 189 BY SIMILARITY.  
 FT CARBOHYD 51 51 N-LINKED (GLCNAC. . .) (POTENTIAL).  
 FT CARBOHYD 65 65 N-LINKED (GLCNAC. . .) (POTENTIAL).  
 FT CARBOHYD 110 110 N-LINKED (GLCNAC. . .) (POTENTIAL).  
 FT CONFLICT 16 16 F -> L (IN REF. 2).  
 FT CONFLICT 108 108 L -> P (IN REF. 2).  
 SQ SEQUENCE 194 AA; 21335 MW; C025AAB0528131A9 CRC64;

Query Match 75.9%; Score 752.5; DB 1; Length 194;  
 Best Local Similarity 77.8%; Pred. No. 2.9e-64;  
 Matches 151; Conservative 10; Mismatches 32; Indels 1; Gaps 1;

QY 1 MGVEHCPAMWMLLSLPLGLVGLGAPRLICDSRVLEERYLLLEAKENITTCGAHC 60  
 DB 1 MGARDCPTLLLSLPLGLVGLGAPRLICDSRVLEERYLLLEAKENITTCGAHC 60

QY 61 SLNENITVPPTKYNFAFKRNKXSOQAVEWQGLALSEVLRGQALLVNSSQPPWEPLQ 120  
 DB 61 SFSENITVPPTKYNFAFKRNKXSOQAVEWQGLALSEVLRGQALLVNSSQPPWEPLQ 120

QY 121 HVDKAVSGRLSLTLTLRALGAQKEAISPPDAASAPLRTTADTPFKLFVYSNFKRL 179  
 DB 121 HVDKAVSGRLSLTLTLRALGAQKEAISPPDAASAPLRTTADTPFKLFVYSNFKRL 180

QY 180 LKLYTGEACRTGDR 193  
 DB 181 LKLYTGEACRTGDR 194

RESULT 7  
 EPO\_PIG  
 ID EPO\_PIG STANDARD; PRT; 190 AA.  
 AC P49157;  
 DT 01-FEB-1996 (Rel. 33, Created)  
 DT 01-FEB-1996 (Rel. 33, Last sequence update)  
 DT 16-OCT-2001 (Rel. 40, Last annotation update)  
 DE Erythropoietin precursor (Fragment).  
 GN EPO.

OS Sus scrofa (Pig).  
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  
 OC Mammalia; Eutheria; Cetartiodactyla; Suina; Suidae; Sus.  
 OX NCBI\_TaxID=9823;  
 RN [1]  
 RP SEQUENCE FROM N.A.  
 RC TISSUE=Kidney;  
 RC MEDLINE=93372347; PubMed=8364201;  
 RA Wen D., Boissel J.P., Tracy T.E., Gruninger R.H., Mulcahy L.S.,  
 RA Czeisler J., Goodman M., Bunn H.F.;  
 RT "Erythropoietin structure-function relationships: high degree of  
 RT sequence homology among mammals";  
 RL Blood 82:1507-1516(1993).  
 CC -I- FUNCTION: ERYTHROPOIETIN IS THE PRINCIPAL HORMONE INVOLVED IN THE  
 CC REGULATION OF ERYTHROCYTE DIFFERENTIATION AND THE MAINTENANCE OF A  
 CC PHYSIOLOGICAL LEVEL OF CIRCULATING ERYTHROCYTE MASS.  
 CC -I- SUBCELLULAR LOCATION: Secreted.  
 CC -I- TISSUE SPECIFICITY: PRODUCED BY KIDNEY OR LIVER OF ADULT MAMMALS  
 CC AND BY LIVER OF FETAL OR NEONATAL MAMMALS.  
 CC -I- SIMILARITY: BELONGS TO THE EPO / TPO FAMILY.  
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 CC or send an email to [license@sib-sib.ch](mailto:license@sib-sib.ch)).  
 CC -----  
 CC EMBL: L10607; AAA1029.1; -  
 CC PIR: I46578; I46578.  
 DR DR HSSP: P01588; ICN4.  
 DR DR InterPro: IPR001323; Erythroptn.  
 DR DR Pfam: PF00758; EPO\_TPO; 1.  
 DR DR PRINTS: PR00272; ERYTHROPTN.  
 DR DR PROSITE: PS00817; EPO\_TPO; 1.  
 DR KM Erythrocyte maturation; Glycoprotein; Hormone; Signal.  
 FT FT NON\_TER 1 1  
 FT FT SIGNAL <1 22  
 FT FT CHAIN 23 190  
 FT FT DISULFID 29 185  
 FT FT DISULFID 51 55  
 FT FT CARBOHYD 46 46  
 FT FT CARBOHYD 60 60  
 FT FT CARBOHYD 105 105  
 FT FT CARBOHYD 168 168  
 FT FT CARBOHYD 168 168  
 SQ SEQUENCE 190 AA; 20888 MW; A75BD6CCE5077E2A CRC64;

Query Match 75.5%; Score 748.5; DB 1; Length 190;  
 Best Local Similarity 81.2%; Pred. No. 6, 8e-64;  
 Matches 155; Conservative 7; Mismatches 26; Indels 3; Gaps 2;

OY 5 ECPANLWLLSLSLPLGLPVGAPRLICDSRVLELYLEKAEKNTTGAHQSLNE 64  
 DB 1 ECPANLWLLSLSLPLGLPVGAPRLICDSRVLELYLEKAEKNTTGAHQSLNE 59  
 OY 65 NITVDTKVFYAMKRNKXKQAVEVMOGLALSEAVLNGALLVNSQWPEPLDHYDK 124  
 DB 60 NITVDTKVFYAMKRNKXKQAVEVMOGLALSEAVLNGALLVNSQWPEPLDHYDK 119  
 OY 125 AVSGRLSLTLRALGAQKEAISPPDA--ASAPLRTITADTFKRLFRVYSNFGKGLK 182  
 DB 120 AVSGRLSLTLRALGAQKEAISPPDA--ASAPLRTITADTFKRLFRVYSNFGKGLK 179  
 OY 183 YTGECARTGDR 193  
 DB 180 YTGECARTGDR 190

RESULT 8  
 EPO\_MOUSE STANDARD; PRT; 192 AA.

AC P07321;  
 DT 01-APR-1988 (Rel. 07, Created)  
 DT 01-APR-1988 (Rel. 07, Last sequence update)  
 DT 16-OCT-2001 (Rel. 40, Last annotation update)  
 DE Erythropoietin precursor.  
 GN EPO.  
 OS Mus musculus (Mouse).  
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  
 OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.  
 OX NCBI\_TaxID=10090;  
 RN [1]  
 RP SEQUENCE FROM N.A.  
 RC MEDLINE=87039105; PubMed=3773894;  
 RA Shoemaker C.B., Mitsuoka L.D.;  
 RT "Murine erythropoietin gene: cloning, expression, and human gene  
 RT homology";  
 RL Mol. Cell. Biol. 6:849-858(1986).  
 RN [2]  
 RP SEQUENCE FROM N.A.  
 RC MEDLINE=87039104; PubMed=3022133;  
 RA McDonald J.D., Lin F.-K., Goldwasser E.;  
 RT "Cloning, sequencing, and evolutionary analysis of the mouse  
 RT erythropoietin gene";  
 RL Mol. Cell. Biol. 6:842-848(1986).  
 RN [3]  
 RP SEQUENCE FROM N.A.  
 RC STRAIN=129/Sv;  
 RX MEDLINE=21138439; PubMed=11239002;  
 RA Wilson M.D., Riemer C., Martindale D.W., Schnupf P., Boright A.P.,  
 RA Cheung T.L., Hardy D.M., Schwartz S., Scherer S.W., Tsui L.-C.,  
 RA Miller W., Koop B.F.;  
 RT "Comparative analysis of the gene-dense ACHE/TFR2 region on human  
 RT chromosome 7q22 with the orthologous region on mouse chromosome 5";  
 RL Nucleic Acids Res. 29:1352-1365(2001).  
 RN [4]  
 RP SEQUENCE OF 1-52 FROM N.A.  
 RC STRAIN=ICFW;  
 RX MEDLINE=98030528; PubMed=9365246;  
 RA Chretien S., Duprez V., Maouche L., Gisselbrecht S., Mayeux P.,  
 RA Lacombe C.;  
 RT "Abnormal erythropoietin (Epo) gene expression in the murine  
 RT erythroleukemia IM32 cells results from a rearrangement between the  
 RT G-protein beta2 subunit gene and the Epo gene";  
 RL Oncogene 15:1995-1999(1997).  
 CC -I- FUNCTION: ERYTHROPOIETIN IS THE PRINCIPAL HORMONE INVOLVED IN THE  
 CC REGULATION OF ERYTHROCYTE DIFFERENTIATION AND THE MAINTENANCE OF A  
 CC PHYSIOLOGICAL LEVEL OF CIRCULATING ERYTHROCYTE MASS.  
 CC -I- SUBCELLULAR LOCATION: Secreted.  
 CC -I- TISSUE SPECIFICITY: PRODUCED BY KIDNEY OR LIVER OF ADULT MAMMALS  
 CC AND BY LIVER OF FETAL OR NEONATAL MAMMALS.  
 CC -I- SIMILARITY: BELONGS TO THE EPO / TPO FAMILY.  
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 CC -----  
 CC EMBL: M12482; AAA37568.1; -  
 CC EMBL: M12930; AAA37570.1; -  
 CC EMBL: AF312033; AAK28825.1; -  
 CC EMBL: Y11971; CAA72707.1; -  
 CC PIR: A24902; A24902.  
 DR DR HSSP: P01588; ICN4.  
 DR DR MGD: MGT:95407; EPO.  
 DR DR InterPro: IPR001323; EPO\_TPO.  
 DR DR Pfam: PF00758; EPO\_TPO; 1.  
 DR DR PRINTS: PR00272; ERYTHROPTN.  
 DR DR PROSITE: PS00817; EPO\_TPO; 1.  
 DR KM Erythrocyte maturation; Glycoprotein; Hormone; Signal.



DR HSP: P01588; 1CMA.  
 DR InterPro: IPR001323; Epo\_TPO.  
 DR InterPro: IPR003013; Erythroptn.  
 DR Pfam: PF00758; Epo\_TPO; 1.  
 DR PRINTS: PR00272; ERYTHROPTN.  
 DR PROSITE: PS00817; Epo\_TPO; 1.  
 DR Erythrocyte maturation; Glycoprotein; Hormone; Signal.  
 KW NON\_TER 1  
 FT SIGNAL 1 22  
 FT CHAIN 23 >175  
 FT DISULFID 29 >175  
 FT DISULFID 51 55  
 FT CARBOHYD 46 46  
 FT CARBOHYD 60 60  
 FT CARBOHYD 105 105  
 FT NON\_TER 175  
 SQ SEQUENCE 175 AA; 19193 MW; B504FBDE86676BF4 CRC64;  
 Query Match 70.6%; Score 699.5; DB 1; Length 175;  
 Best Local Similarity 80.1%; Pred. No. 2.7e-59;  
 Matches 141; Conservative 12; Mismatches 22; Indels 1; Gaps 1;  
 OY 5 ECPAMWLLSLPLGLPVGAPRLICDSRVLELYLEAKENITTCGAHCSLNE 64  
 DB 1 ECPA-LLLSLPLGLPVGAPRLICDSRVLELYLEAKENITTCGAHCSLNE 59  
 OY 65 NITVPDVKYFYAMKRNKXQQAWEVWGALLSEAVLNGALLVNSQWPEPLDHYDK 124  
 DB 60 NITVPDVKYFYAMKRNKXQQAWEVWGALLSEAVLNGALLVNSQWPEPLDHYDK 119  
 OY 125 AVSGRLTTLRLAIGAKKEAISPPDASAAPRLRTTADTRFKLFRVNSNPLRGKL 180  
 DB 120 AVSGRLTTLRLAIGAKKEAISPPDASAAPRLRTTADTRFKLFRVNSNPLRGKL 175  
 RESULT 11  
 TPO\_CANFA  
 ID TPO\_CANFA STANDARD; PRT; 352 AA.  
 AC P42705;  
 DT 01-NOV-1995 (Rel. 32, Created)  
 DT 01-NOV-1995 (Rel. 32, Last sequence update)  
 DT 16-OCT-2001 (Rel. 40, Last annotation update)  
 DE Thrombopoietin precursor (Megakaryocyte colony stimulating factor)  
 DE (C-MPL ligand) (ML) (Megakaryocyte growth and development factor)  
 DE (MGDF).  
 GN THPO OR TPO.  
 OS Canis familiaris (Dog).  
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  
 OC Mammalia; Eutheria; Carnivora; Fissipedia; Canidae; Canis.  
 OX NCBI\_TaxID=9615;  
 RN [1]  
 RP SEQUENCE FROM N.A., AND SEQUENCE OF 24-44.  
 RC TISSUE=Kidney;  
 RX MEDLINE=94291201; PubMed=8020099;  
 RA Bartley T.D., Bogenberger J., Hunt P., Li Y.-S., Lu H.S., Martin F.,  
 RA Chang M.-S., Samal B.B., Nichol J.L., Swift S., Johnson M.J.,  
 RA Hsu R.-Y., Parker V.P., Suggs S., Skrine J.D., Meteweller L.A.,  
 RA Clogson C., Hsu E., Hokom M.M., Hornkohl A., Choi E., Pangellian M.,  
 RA Sun Y., Mar V., McNich J., Simonet L., Jacobsen F., Xie C.,  
 RA Shuter J., Chute H., Basu R., Selander L., Trollinger D., Siu L.,  
 RA Padilla D., Trail G., Elliott G., Izumi R., Covey T., Crouse J.,  
 RA Garcia A., Xu W., del Castillo J., Biron J., Cole S., Hu M.C.-T.,  
 RA Pacific R., Ponting I., Satis C., Wen D., Yung Y.P., Lin H.,  
 RA Bosselman R.A.;  
 RT "Identification and cloning of a megakaryocyte growth and development  
 RT factor that is a ligand for the cytokine receptor Mpl.";  
 RL Cell 77:1117-1117(1994).  
 CC -!- FUNCTION: LINEAGE-SPECIFIC CYTOKINE AFFECTING THE PROLIFERATION  
 CC AND MATURATION OF MEGAKARYOCYTES FROM THEIR COMMITTED PROGENITOR  
 CC CELLS. IT ACTS AT A LATE STAGE OF MEGAKARYOCYTE DEVELOPMENT. IT  
 CC MAY BE THE MAJOR PHYSIOLOGICAL REGULATOR OF CIRCULATING PLATELETS.  
 CC -!- SUBCELLULAR LOCATION: Secreted.  
 CC -!- DOMAIN: TWO-DOMAIN STRUCTURE WITH AN ERYTHROPOIETIN-LIKE N-

CC TERMINAL AND A SER/PRO/THR-RICH C-TERMINAL.  
 CC -!- SIMILARITY: BELONGS TO THE EPO / TPO FAMILY.  
 DR InterPro: IPR001323; Epo\_TPO.  
 DR InterPro: IPR003978; thrombopoietin.  
 DR Pfam: PF00758; Epo\_TPO; 1.  
 DR PRINTS: PR01485; THROMBOPTN.  
 DR PROSITE: PS00817; Epo\_TPO; 1.  
 DR Cytokine; Glycoprotein; Hormone; Signal.  
 KW CYTOKINE: Glycoprotein; Hormone; Signal.  
 FT SIGNAL 1 23  
 FT CHAIN 24 352  
 FT DISULFID 28 172  
 FT DISULFID 50 106  
 FT CARBOHYD 185 185  
 FT CARBOHYD 197 197  
 FT CARBOHYD 206 206  
 FT CARBOHYD 234 234  
 FT CARBOHYD 255 255  
 FT CARBOHYD 332 332  
 FT CARBOHYD 347 347  
 SQ SEQUENCE 352 AA; 37641 MW; 024F3B41B061FBD8 CRC64;  
 Query Match 12.4%; Score 122.5; DB 1; Length 352;  
 Best Local Similarity 25.5%; Pred. No. 0.00034;  
 Matches 47; Conservative 24; Mismatches 70; Indels 43; Gaps 6;  
 OY 12 LLLSLPLPLGLPVGAPRLICDSRVLELYLEAKENITTCGAHCSINENITVPD 70  
 DB 7 LLLVWLLTLARLDPLPAP--ACDPRLINKMLRDSVLSHSLSCPDYPLSTFVLLPA 64  
 OY 71 TKVNFYAMKRNKXQQAWEVWGALLSEAVL--RGQALLVNSQWPEPLDHYDKAVSG 128  
 DB 65 VDFSLGEMTKQKEQRTKADQVWGAVALLLDGVLAARGQL-----G 103  
 OY 129 LRSITTLRLAIGAKKEAISPPDASAAPRLRTTADTRFKLFRVNSNPLRGKL 177  
 DB 104 PSCSLSLGQLSGVRLLLGALLGGLGTLGTLPPQG-----RTTHKDPMAIFLSQQLLR 157  
 OY 178 GKLL 181  
 DB 158 GKYR 161  
 RESULT 12  
 TPO\_HUMAN  
 ID TPO\_HUMAN STANDARD; PRT; 353 AA.  
 AC P40225; Q13020; Q15790; Q15791; Q15792;  
 DT 01-FEB-1995 (Rel. 31, Created)  
 DT 01-FEB-1995 (Rel. 31, Last sequence update)  
 DT 15-SEP-2003 (Rel. 42, Last annotation update)  
 DE Thrombopoietin precursor (Megakaryocyte colony stimulating factor)  
 DE (MPL) (Megakaryocyte growth and development factor) (MGDF).  
 GN THPO.  
 OS Homo sapiens (Human).  
 OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;  
 OC Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.  
 OX NCBI\_TaxID=9606;  
 RN [1]  
 RP SEQUENCE FROM N.A. (ISOFORM 1).  
 RC TISSUE=Fetal liver;  
 RX MEDLINE=94291202; PubMed=8020154;  
 RA de Sauvage F.J., Haas P.E., Spencer S.D., Malloy B.E., Gurney A.L.,  
 RA Spencer S.A., Darbonne W.C., Henzel W.J., Wong S.C., Kuang W.-J.,  
 RA Oles K.J., Hultgren B., Solberg L.A. Jr., Goeddel D.V., Eaton D.L.;  
 RA "Stimulation of megakaryocytopoiesis and thrombopoiesis by the c-Mpl  
 RA ligand.";  
 RL Nature 369:533-538(1994).  
 CC [2]  
 CC SEQUENCE FROM N.A. (ISOFORM 1).  
 RC TISSUE=Fetal liver;  
 RX MEDLINE=94291201; PubMed=8020099;  
 RA Bartley T.D., Bogenberger J., Hunt P., Li Y.-S., Lu H.S., Martin F.,  
 RA Chang M.-S., Samal B.B., Nichol J.L., Swift S., Johnson M.J.,

RA Hsu R.Y., Parker V.P., Suggs S., Skrine J.D., Merewether L.A.,  
 RA Clogson C., Hsu E., Horkom M.M., Hornokohl A., Choi E., Pangellinan M.,  
 RA Sun Y., Mar Y., Mcnich J., Simonet L., Jacobsen F., Xie C.,  
 RA Shutter J., Chute H., Basu R., Selander L., Trollinger D., Sten L.,  
 RA Padilla D., Trill G., Elliott G., Izumi R., Covey T., Crouse J.,  
 RA Garcia A., Xu W., del Castillo J., Biron J., Cole S., Hu M.C.-T.,  
 RA Pacifici R., Ponting I., Sarris C., Wen D., Yung Y.P., Lin H.,  
 RA Bosseman R.A.:  
 RT "Identification and cloning of a megakaryocyte growth and development  
 RT factor that is a ligand for the cytokine receptor Mpl.";  
 RL Cell 77:1117-1124(1994).  
 RN [3]  
 RN SEQUENCE FROM N.A. (ISOFORM 1).  
 RP MEDLINE=95108091; PubMed=7809166;  
 RX Foster D.C., Sprecher C.A., Grant F.J., Kramer J.M., Kuiper J.L.,  
 RA Holly R.D., Whitmore T.E., Heipel M.D., Bell L.A.N., Ching A.F.,  
 RA McGrath V., Harte C., O'Hara P.J., Lok S.,  
 RT "Human thrombopoietin: gene structure, cDNA sequence, expression, and  
 RT chromosomal localization.";  
 RL Proc. Natl. Acad. Sci. U.S.A. 91:13023-13027(1994).  
 RN [4]  
 RN SEQUENCE FROM N.A. (ISOFORM 1).  
 RP MEDLINE=95010765; PubMed=7926022;  
 RX Sonma Y., Akahori H., Seki N., Hori T.-A., Ogami K., Kawamura K.,  
 RA Miyazaki H.:  
 RT "Molecular cloning and chromosomal localization of the human  
 RT thrombopoietin gene.";  
 RL FEBS Lett. 353:57-61(1994).  
 RN [5]  
 RN SEQUENCE FROM N.A. (ISOFORMS 1 AND 2).  
 RP MEDLINE=95152076; PubMed=7849319;  
 RX Guney A.L., Kuang W.-J., Xie M.-H., Malloy B.E., Eaton D.L.,  
 RA de Sauvage F.J.:  
 RT "Genomic structure, chromosomal localization, and conserved  
 RT alternative splice forms of thrombopoietin.";  
 RL Blood 85:981-988(1995).  
 RN [6]  
 RN SEQUENCE FROM N.A. (ISOFORM 1).  
 RP TISSUE=Liver:  
 RC MEDLINE=96015174; PubMed=8537317;  
 RX Kato T., Ogami K., Shimada Y., Iwamatsu A., Sohma Y., Akahori H.,  
 RA Horie K., Kokubo A., Kudo Y., Maeda E., Kobayashi K., Ohashi H.,  
 RA Ozawa T., Inoue H., Kawamura K., Miyazaki H.:  
 RT "Purification and characterization of thrombopoietin.";  
 RL J. Biochem. 118:229-236(1995).  
 RN [7]  
 RN SEQUENCE FROM N.A. (ISOFORM 1).  
 RP TISSUE=Placenta:  
 RC MEDLINE=95122483; PubMed=7822271;  
 RX Chang M., Meninch J., Basu R., Shutter J., Hsu R., Perkins C., Mar V.,  
 RA Suggs S., Welcher A., Li L., Lu H., Bartley T., Hunt P., Martin F.,  
 RA Samal B., Bogenberger J.:  
 RT "Cloning and characterization of the human megakaryocyte growth and  
 RT development factor (MGDF) gene.";  
 RL J. Biol. Chem. 270:511-514(1995).  
 RN [8]  
 RN SEQUENCE FROM N.A. (ISOFORMS 1 AND 3).  
 RP Im S.H., Lee W.S., Chung K.H.:  
 RA "Cloning and sequencing of human thrombopoietin.";  
 RT Submitted (MAY-1996) to the EMBL/GenBank/DBJ databases.  
 RL -1- FUNCTION: LINEAGE-SPECIFIC CYTOKINE AFFECTING THE PROLIFERATION  
 CC AND MATURATION OF MEGAKARYOCYTES FROM THEIR COMMITTED PROGENITOR  
 CC CELLS. IT ACTS AT A LATE STAGE OF MEGAKARYOCYTE DEVELOPMENT. IT  
 CC MAY BE THE MAJOR PHYSIOLOGICAL REGULATOR OF CIRCULATING PLATELETS  
 CC -1- SUBCELLULAR LOCATION: Secreted.  
 CC -1- ALTERNATIVE PRODUCTS:  
 CC Name=1;  
 CC Event=Alternative splicing; Named isoforms=3;  
 CC Name=2; Synonyms=rpo-2;  
 CC Name=3; Synonyms=truncated;  
 CC IsoId=P40225-1; Sequence=VSP\_001450;  
 CC IsoId=P40225-2; Sequence=VSP\_001451;  
 CC IsoId=P40225-3; Sequence=VSP\_001451;

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CC -1- DOMAIN TWO-DOMAIN STRUCTURE WITH AN EYTHROMPOIETIN-LIKE N-
CC -1- TERMINAL AND A SER/PRO/THR-RICH C-TERMINAL.
CC -1- SIMILARITY: BELONGS TO THE EPO / TPO FAMILY.
CC -1- DATABASE: NAME=RD Systems' cytokine source book; TPO;
CC WWW=http://www.rndsystems.com/asp/g_silebuilder.asp?bodyid=225".
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CC
CC EMBL: L33410; AAA59857.1; -
CC EMBL: U11025; AAA50553.1; -
CC EMBL: L36051; AAC37568.1; -
CC EMBL: L36052; AAC37566.1; -
CC EMBL: D32046; BAA06807.1; -
CC EMBL: S76771; AAB33390.1; -
CC EMBL: D32047; BAA21930.1; -
CC EMBL: U53493; AAB03392.1; -
CC EMBL: U54949; AAB03393.1; -
CC EMBL: U54945; AAB03394.1; -
CC EMBL: U17071; AAA74083.1; -
CC PIR: I59281; I80105.
CC Genew: HGNC:11795; THPO.
CC MIM: 600044; -.
CC GO: GO:0008083; F:growth factor activity; TAS.
CC GO: GO:0008283; P:cell proliferation; TAS.
CC GO: GO:0007275; P:development; TAS.
CC InterPro: IPR001323; EPO_TPO.
CC InterPro: IPR003978; Thrombopoietin.
CC Pfam: PF00758; EPO_TPO; 1.
CC PRINTS: PRO1485; THROMBOPTN.
CC PROSITE: PS00817; EPO_TPO; 1.
CC K1 cytokine; Glycoprotein; Hormone; Signal; Alternative splicing;
CC K2 Polymorphism.
CC K3 SIGNAL 1 21 POTENTIAL.
CC FT CHAIN 22 353 THROMBOPOIETIN.
CC FT DISULFID 28 172 POTENTIAL.
CC FT DISULFID 50 106 POTENTIAL.
CC FT CARBOHYD 197 197 N-LINKED (GLCNAC. . .) (POTENTIAL).
CC FT CARBOHYD 206 206 N-LINKED (GLCNAC. . .) (POTENTIAL).
CC FT CARBOHYD 234 234 N-LINKED (GLCNAC. . .) (POTENTIAL).
CC FT CARBOHYD 255 255 N-LINKED (GLCNAC. . .) (POTENTIAL).
CC FT CARBOHYD 340 340 N-LINKED (GLCNAC. . .) (POTENTIAL).
CC FT CARBOHYD 348 348 N-LINKED (GLCNAC. . .) (POTENTIAL).
CC FT VARSPIC 133 136 Missing (in isoform 2).
CC FT VARSPIC 160 198 /FTid=VSP_001450.
CC FT VARSPIC 14 14 Missing (in isoform 3).
CC FT VARIANT 14 14 /FTid=VSP_001451.
CC FT VARIANT 116 116 G->E (IN dbSNP:1126665).
CC FT VARIANT 116 116 G->E (IN dbSNP:1126665).
CC FT CONFLICT 46 46 R->K (IN REF. 8).
CC FT CONFLICT 76 76 R->MSQ (IN REF. 7).
CC FT CONFLICT 113 113 Q->E (IN REF. 2).
CC FT CONFLICT 131 131 T->S (IN REF. 7).
CC FT CONFLICT 277 277 G->E (IN REF. 8; AAB03393/AAB03394).
CC FT CONFLICT 346 346 S->C (IN REF. 8; AAB03393/AAB03394).
CC SEQUENCE 353 AA; 37822 MW; F0AB549872E5526 CRC64;
Query Match 9.9%; Score 98.5; DB 1; Length 353;
Best Local Similarity 26.7%; Pred. No. 0.055;
Matches 46; Conservative 21; Mismatches 82; Indels 23; Gaps 6
12 LILSLSLDGLGIPVIGAPPRLICDSRYERVLLEAKAEANITTCGAHCISINENITVPDT 71
11 MLTLTRRLTSLSP---APP--ACDLRVLSKTLRSHVLRSLQCEPVHPLPRPVLLP 65
72 KVFVFAWKRNKNSXQQAVEVWGLALISEAVL--RGOALLVNSSQPEWPIQLHVDKAVSGL 129

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Db      66  DFGSGWMTQMETRAQDILGAVTLLEBVMARQGLGFCCLSLGQSLGQVRLILGAL 125
Oy      130 RSLTTLRLALGAQKEAISPDDAASAPLRTITADFRKLFRRVYSNFLRGK 181
Db      126 OSL-----LGRV---LPPQG-----RTTAHKDPAINFSLFQHLHGRKVR 161

RESULT 13
TPO_MOUSE
ID      TPO_MOUSE      STANDARD:      PRT;      356 AA.
AC      P40226;
DT      01-FEB-1995 (Rel. 31, Created)
DT      01-FEB-1995 (Rel. 31, Last sequence update)
DT      15-SEP-2003 (Rel. 42, Last annotation update)
DE      Thrombopoietin precursor (Megakaryocyte colony stimulating factor)
DE      (Myeloproliferative leukemia virus oncogene ligand) (C-mpl ligand)
DE      (Mpl) (Megakaryocyte growth and development factor) (MGDF).
GN      THPO.
OC      Mus musculus (Mouse).
OC      Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC      Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.
OX      NCBI_Taxid=10090;
RX      [1]
RX      SEQUENCE FROM N.A. (ISOFORM 1).
RX      TISSUE-Kidney;
RA      MEDLINE=94261207; PubMed=8202158;
RA      Lok S., Kaushansky K., Holly R.D., Kuijper J.L., Lofton-Day C.E.,
RA      Oort P.J., Grant F.J., Helper M.D., Burkhead S.K., Kramer J.M.,
RA      Bell L.A.N., Sprecher C.A.L., Blumberg H., Johnson R., Plunkard D.,
RA      Chung A.F.T., Mathews S.L., Bailey M.C., Forstom J.W., Buddle M.M.,
RA      Osborn F.S., Evans G.J., Sheppard P.O., Pressnell S.R., O'Hara P.D.,
RA      Hagen F.S., Roth G.J., Foster D.C.;
RT      "Cloning and expression of murine thrombopoietin cDNA and stimulation
RT      of platelet production in vivo.";
RL      Nature 369:565-568(1994).
RL      [2]
RP      SEQUENCE FROM N.A. (ISOFORM 1).
RP      TISSUE-Liver;
RX      MEDLINE=94291201; PubMed=8020099;
RA      Bartley T.D., Bogenberger J., Hunt P., Li Y.-S., Lu H.S., Martin F.,
RA      Chang M.-S., Samel B.B., Nichol J.L., Swift S., Johnson M.J.,
RA      Hsu R.-Y., Parker V.P., Suggs S., Skrine J.D., Merewether L.A.,
RA      Clogson C., Hsu E., Hokom R.M., Hornkohl A., Choi E., Pangelinan M.,
RA      Sun Y., Mar V., McNich J., Simonet L.E., Jacobsen F., Xie C.,
RA      Shuller J., Chute H., Basu R., Selander L., Trollinger D., Siu L.,
RA      Padilla D., Trail G., Elliott G., Izumi R., Covey T., Crouse J.,
RA      Garcia A., Xu W., del Castillo J., Biton J., Cole S., Hu M.C.-T.,
RA      Pacifici R., Ponting I., Saris C., Wen D., Yung Y.P., Lin H.,
RA      Bosselman R.A.;
RT      "Identification and cloning of a megakaryocyte growth and development
RT      factor that is a ligand for the cytokine receptor Mpl.";
RL      Cell 77:1117-1117(1994).
RL      [3]
RP      SEQUENCE FROM N.A. (ISOFORMS 1 AND 2).
RP      MEDLINE=95152076; PubMed=7849319;
RA      Gurney A.L., Kuang W.-J., Xie M.-H., Malloy B.E., Eaton D.L.,
RA      de Sauvage F.J.;
RT      "Genomic structure, chromosomal localization, and conserved
RT      alternative splice forms of thrombopoietin.";
RL      Blood 85:981-988(1995).
CC      -1- FUNCTION: LINGAGE-SPECIFIC CYTOKINE AFFECTING THE PROLIFERATION
CC      AND MATURATION OF MEGAKARYOCYTES FROM THEIR COMMITTED PROGENITOR
CC      CELLS. IT ACTS AT A LATE STAGE OF MEGAKARYOCYTE DEVELOPMENT. IT
CC      MAY BE THE MAJOR PHYSIOLOGICAL REGULATOR OF CIRCULATING PLATELETS.
CC      -1- SUBCELLULAR LOCATION: Secreted.
CC      -1- ALTERNATIVE PRODUCTS:
CC      Event-Alternative splicing; Named isoforms=2;
CC      Name=1;
CC      IsoId=P40226-1; Sequence=Displayed;
CC      Name=2; Synonyms=TPO-2;
CC      IsoId=P40226-2; Sequence=VSP_001452;
CC      -1- TISSUE SPECIFICITY: FOUND MAINLY IN THE LIVER, KIDNEY AND SKELETAL

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CC CC MUSCLE. TWO-DOMAIN STRUCTURE WITH AN ERYTHROPOIETIN-LIKE N-
CC CC -I- DOMAIN AND A SER/PRO/THR-RICH C-TERMINAL.
CC CC -I- SIMILARITY: BELONGS TO THE EPO / TPO FAMILY.
CC CC -----
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CC CC or send an email to license@isb-slb.ch).
CC CC -----
CC CC EMBL: L34169; AAA40436.1; -.
CC CC PIR: S45330; S45330.
CC CC MGD: MGI:101875; Thpo.
CC CC DR InterPro: IPR001323; EPO_TPO.
CC CC DR InterPro: IPR003978; thrombopoietin.
CC CC DR Pfam: PF00758; EPO_TPO; 1.
CC CC DR PRINTS: PRO1485; THROMBOPTN.
CC CC DR PROSITE: PS00817; EPO_TPO; 1.
CC CC Cyclokin; Glycoprotein; Hormone; Signal; Alternative splicing.
CC CC KW SIGNAL 1 21
CC CC FT CHAIN 22 356
CC CC FT DISULFID 28 172
CC CC FT CARBOHYD 50 106
CC CC FT CARBOHYD 197 197
CC CC FT CARBOHYD 206 206
CC CC FT CARBOHYD 235 235
CC CC FT CARBOHYD 249 249
CC CC FT CARBOHYD 256 256
CC CC FT CARBOHYD 336 336
CC CC FT CARBOHYD 351 351
CC CC FT VARSPPLIC 133 136
CC CC FT FT
CC CC FT FT
CC CC FT FT
CC CC SEQUENCE 356 AA; 37835 MW; D346DBAE8392053C CRC64;
CC CC -----
CC CC Query Match 9.2%; Score 91; DB 1; Length 356;
CC CC Best Local Similarity 25.1%; Pred. No. 0.34;
CC CC Matches 44; Conservative 28; Mismatches 79; Indels 24; Gaps 6.
CC CC -----
CC CC QY 12 LLLSLSPPLPLVPGAPPRILICDSRYLERYLLLEAKENITTCGAECISLNIENITVPT 71
CC CC |||:::|:::|:::|:::|:::|:::|:::|:::|:::|:::|:::|:::|:::|:::|
CC CC DB 6 LLLAAMLLAVARLLLSVPAACDPRLINKLRBSLLHSRLSQCSPVDPLSIPVLEAV 65
CC CC QY 72 KVNFEYAMKRNKSXOOAVEVWOGLLLSAVL--RQGLLLVNSQPEWELQIHDVKAVSGL 129
CC CC ::||:::|:::|:::|:::|:::|:::|:::|:::|:::|:::|:::|:::|:::|
CC CC DB 66 DFIGEMWKTQFEQSKADILGAVSLLEGGVMAARGQL-----EFSCLS-----SL 111
CC CC QY 130 RSLTTLRL-ALGAKQKEALSPDDASAAFL--RTIADLFRFLFRYNSFLGKLIK 181
CC CC |:::|:::|:::|:::|:::|:::|:::|:::|:::|:::|:::|:::|:::|:::|
CC CC DB 112 GQLSGQVRLLEGALQGLL-----GTQLPLOGRTTANKPDNALFLSLQGLRQKVR 161
CC CC |:::|:::|:::|:::|:::|:::|:::|:::|:::|:::|:::|:::|:::|:::|
CC CC -----
CC CC RESULT 14
CC CC TPO_RAT
CC CC ID TPO_RAT STANDARD: PRT: 326 AA.
CC CC AC P49745;
CC CC DT 01-OCT-1996 (Rel. 34, Created)
CC CC DT 01-OCT-1996 (Rel. 34, Last sequence update)
CC CC DT 16-OCT-2001 (Rel. 40, Last annotation update)
CC CC DE Thrombopoietin precursor.
CC CC THPO.
CC CC OS Rattus norvegicus (Rat).
CC CC OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
CC CC CC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Rattus.
CC CC NCBI_Taxid=10116;
CC CC RN [1]
CC CC RP SEQUENCE FROM N.A.
CC CC RC TISSUE=Liver;
CC CC RX MEDLINE=95331639; PubMed=7607561;
CC CC RA Ogami K., Shimada Y., Sohna Y., Akahori H., Kato T., Kawamura K.,
CC CC Miyazaki H.;

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CC      diverse assortment of congenital malformations, and a
CC      predisposition to the development of malignancies. At the cellular
CC      level it is associated with hypersensitivity to DNA-damaging
CC      agents, chromosomal instability (increased chromosome breakage),
CC      and defective DNA repair.
CC      -! DATABASE: NAME=Atlas Genet. Cytogenet. Oncol. Haematol.;
CC      WWW="http://www.infobiogen.fr/services/chromocancer/Genes/FANCGID295.html".
CC
CC      This SWISS-PROT entry is copyright. It is produced through a collaboration
CC      between the Swiss Institute of Bioinformatics and the EMBL outstation
CC      the European Bioinformatics Institute. There are no restrictions on its
CC      use by non-profit institutions as long as its content is in no way
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CC      entities requires a license agreement (See http://www.isb-sib.ch/announce/
CC      or send an email to license@isb-sib.ch).
CC
CC      EMBL; U70310; AAB80802.1; -.
CC      DR EMBL; AJ007669; CAA07602.1; -.
CC      DR EMBL; AC004472; AAC07981.1; -.
CC      DR EMBL; BC000032; AAH00032.1; -.
CC      PIR; T02244; T02244.
CC      DR Genew; HGNC:3588; FANCG.
CC      DR MIM; 602956; -.
CC      DR GO; GO:0003685; F:DNA repair protein; TAS.
CC      DR GO; GO:0008181; F:tumor suppressor; TAS.
CC      DR GO; GO:0000075; P:cell cycle checkpoint; TAS.
CC      DR GO; GO:0006281; P:DNA repair; TAS.
CC      DR InterPro; IPR001440; TPR.
CC      DR Pfam; PF00515; TPR; 2.
CC      DR DNA repair; Nuclear protein.
CC      SQ SEQUENCE 622 AA; 68553 MW; 4BC7475472AC3C84 CRC64;
CC
OY      Query Match      8.7%; Score 86.5; DB 1; Length 622;
OY      Best Local Similarity 25.8%; Pred. No. 1.7;
OY      Matches 49; Conservative 23; Mismatches 83; Indels 35; Gaps 6;
OY
OY      12 LLLSLPLGLPVIGAPRLICDSRVLERYLLEAKAEENITTCGAHC--SLNENITVP 69
OY      || || || || || || || || || || || || || || || || || || ||
OY      53 LHSILOGPAAVAVPVLPLELTVGNF-----ITLRASLAOGFTEDQAQDIQSLERYLETQ 107
OY
OY      70 DTKVNFYAMKRNKXSXQAAVEVWQGLALLSEAVLRGOAL--LVNSSQPEWPEQLQHYDKAV 126
OY      : : : : : : : : : : : : : : : : : : : : : : : : : :
OY      108 E-----QQGPRLEQGLRELDVSLVRASCLPLPELLSLHLRLVGLQAALWLSA 153
OY
OY      127 SGLRSLITLRLA-----GAQKEAI-----SPPDASAAPLRTITADTFRKLFRVYSNF 175
OY      | | | | | | | | | | | | | | | | | | | | | | | | | |
OY      154 DRLGDLALLETLNQSQSGAKDLILLKTKWSPPAEILDAPLTDAGSLKDVLLTAAY 213
OY
OY      176 LRGKLKLYTG 185
OY      : | : | ||
OY      214 RGLQGLLITG 223
```

Search completed: September 8, 2003, 15:01:17  
Job time : 18 secs

GenCore version 5.1.6  
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OM protein - protein search, using sw model

Run on: September 8, 2003, 14:57:36 ; Search time 20 seconds

(without alignments)  
928.028 Million cell updates/sec

Title: US-09-813-775c-34

Sequence: 1 MGVHECPAWMLLLSLSLP.....NFLRGKLVYTGACRTGDR 193

Scoring table: BLOSUM62  
Gapop 10.0 , Gapext 0.5

Searched: 283308 seqs, 96168682 residues

Total number of hits satisfying chosen parameters: 283308

Minimum DB seq length: 0  
Maximum DB seq length: 2000000000

Post-processing: Minimum Match 0%  
Maximum Match 100%

Listing first 45 summaries

Database :  
1: p1r1:\*  
2: p1r2:\*  
3: p1r3:\*  
4: p1r4:\*

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

#### SUMMARIES

Result No.	Score	Query Match	Length	DB ID	Description
1	973	98.2	193	1 ZUHU	erythropoietin pre
2	881.5	89.0	192	1 JCU0173	erythropoietin pre
3	879.5	88.7	192	1 I84613	erythropoietin pre
4	779.5	78.7	188	1 I46083	erythropoietin pre
5	762.5	76.9	192	1 S28148	erythropoietin pre
6	752.5	75.9	194	1 I46401	erythropoietin pre
7	748.5	75.5	190	2 I46578	erythropoietin pre
8	738.5	74.5	192	1 A24902	erythropoietin pre
9	729	73.6	195	2 JC7699	erythropoietin pre
10	699.5	70.6	175	2 I46199	erythropoietin - d
11	109	11.0	353	2 G02729	erythropoietin - h
12	98.5	9.9	353	2 I80105	thrombopoietin pre
13	95.5	9.6	286	2 A55530	megakaryocyte grow
14	91	9.2	356	2 S45330	thrombopoietin - m
15	87.5	8.8	326	2 JC4125	thrombopoietin pre
16	87.5	8.8	346	2 AE0959	Solute binding rec
17	86.5	8.7	622	2 T02244	probable DNA repl
18	85	8.6	235	2 JC4227	thrombopoietin pre
19	84	8.5	339	2 A83274	UDP-N-acetylpyruv
20	81.5	8.2	480	2 S56339	ribosomal protein
21	81	8.2	323	2 AB0323	ribonucleoside-dip
22	80	8.1	353	2 AG0138	quinolinate synthe
23	80	8.1	1336	2 T18288	ABC transport prot
24	80	8.1	1980	2 S54307	myosin heavy chain
25	79.5	8.0	475	2 D84064	succinate-semialde
26	79	8.0	743	2 D75590	methyl-accepting c
27	79	8.0	1089	2 S53978	PSE1 protein - yea
28	78.5	7.9	296	2 A10443	probable 2-hydroxy
29	78.5	7.9	348	2 T35450	ABC transporter AT

30	78.5	7.9	2201	2 AH0095
31	78	7.9	384	2 A12962
32	78	7.9	389	2 E98320
33	78	7.9	451	2 S75569
34	78	7.9	1189	2 I39711
35	77.5	7.8	242	2 AD1928
36	77.5	7.8	567	2 T08405
37	77.5	7.8	774	2 F96639
38	77	7.8	416	2 B84276
39	76.5	7.7	544	2 S37035
40	76.5	7.7	1638	2 T30313
41	76.5	7.7	2472	2 E83594
42	76	7.7	552	2 S39765
43	76	7.7	554	2 T27878
44	75	7.6	263	2 B75361
45	74.5	7.5	453	2 AG2919

#### ALIGNMENTS

##### RESULT 1

ZUHU

erythropoietin precursor [validated] - human

C:Species: Homo sapiens (man)

C:Date: 27-Nov-1985 #sequence\_revision 27-Nov-1985 #text\_change 08-Dec-2000

C:Accession: A01855; A24744; A25384; A22210; S56178

R:Jacobs, K.; Shoemaker, C.; Ruderstorf, R.; Neill, S.D.; Kaufman, R.J.; Mufson, A.;

Nature 313, 806-810, 1985

A:Title: Isolation and characterization of genomic and cDNA clones of human erythropo

A:Reference number: A01855; MUID:85137899; PMID:383366

A:Accession: A01855

A:Molecule type: mRNA, DNA

A:Residues: 1-193 <DCC>

A:Cross-references: GB:X02157; GB:X02158

R:Lin, F.K.; Suggs, S.; Lin, C.H.; Browne, J.K.; Smalling, R.; Egrie, J.C.; Chen, K.K

Proc. Natl. Acad. Sci. U.S.A. 82, 7580-7584, 1985

A:Title: Cloning and expression of the human erythropoietin gene.

A:Reference number: A24744; MUID:86067948; PMID:3865178

A:Accession: A24744

A:Molecule type: DNA

A:Residues: 1-193 <LIN>

A:Cross-references: GB:M1319; NID:9182197; PIDN:AA52400.1; PID:9182198

R:lai, P.H.; Everett, R.; Wang, F.F.; Arakawa, T.; Goldwasser, E.

J. Biol. Chem. 261, 3116-3121, 1986

A:Title: Structural characterization of human erythropoietin.

A:Reference number: A25384; MUID:86140080; PMID:3949763

A:Accession: A25384

A:Molecule type: protein

A:Residues: 28-86, 'Q', 87-193 <LAT>

A:Experimental source: urine

A:Note: Forms without the carboxyl-terminal residue and the four carboxyl-terminal re

R:Yanagawa, S.; Hirade, K.; Ohnoka, H.; Sasaki, R.; Chiba, H.; Ueda, M.; Goto, M.

J. Biol. Chem. 259, 2707-2710, 1984

A:Title: Isolation of human erythropoietin with monoclonal antibodies.

A:Reference number: A22210; MUID:84135751; PMID:6698989

A:Accession: A22210

A:Molecule type: protein

A:Residues: 28-29, 'X', 31-33, 'L', 35-50, 'X', 52-53, 'D', 55, 'G', 57 <YAN>

R:Matsumoto, S.; Ikura, K.; Ueda, M.; Sasaki, R.

Plant Mol. Biol. 27, 1163-1172, 1995

A:Title: Characterization of a human glycoprotein (erythropoietin) produced in cultur

A:Reference number: S56178; MUID:95284365; PMID:7766897

A:Accession: S56178

A:Molecule type: protein

A:Residues: 28-33, 'X', 35-37 <MTS>

C:Comment: Erythropoietin is produced by kidney or liver of adult mammals and by live

C:Genetics:

A:Gene: GDB:EPO

A:Cross-references: GDB:119110; OMTM:133170

A:Map position: 7q21.3-7q22.1

A:Introns: 5/1; 53/3; 82/3; 142/3

C:Function:

A:Description: the primary inducer of erythrocyte formation  
 C:Superfamily: erythropoietin  
 C:Keywords: erythropoiesis; glycoprotein; hormone; kidney; liver  
 F:1-27/Domain: signal sequence #status predicted <SIG>  
 F:28-193/Product: erythropoietin #status experimental <MAT>  
 F:34-188,56-60/Disulfide bonds: #status experimental  
 F:51,65,110/Binding site: carbohydrate (Asn) (covalent) #status experimental  
 F:153/Binding site: carbohydrate (Ser) (covalent) #status experimental

Query Match 98.2%; Score 973; DB 1; Length 193;  
 Best Local Similarity 97.9%; Pred. No. 1,4e-86;  
 Matches 189; Conservative 0; Mismatches 4; Indels 0; Gaps 0;

QY 1 MGVHCPAMWLWLLSLSPGLPVLGAPPRILICDSRYLERLYLLEAKENITTCACHC 60  
 DB 1 MGVHCPAMWLWLLSLSPGLPVLGAPPRILICDSRYLERLYLLEAKENITTCACHC 60  
 QY 61 SLNENITVPDTRKYNFYAMKRNKXSXQAAVEWOGALLSEAVLRGQALLVNSSQPEPQL 120  
 DB 61 SLNENITVPDTRKYNFYAMKRNKXSXQAAVEWOGALLSEAVLRGQALLVNSSQPEPQL 120  
 QY 121 HVDAVSGLSRLTTLRLALGAQKEAISPDDAASAPLRTITADTRFKLFRVYSNFLRGKL 180  
 DB 121 HVDAVSGLSRLTTLRLALGAQKEAISPDDAASAPLRTITADTRFKLFRVYSNFLRGKL 180  
 QY 181 KLYTGEACRTGDR 193  
 DB 181 KLYTGEACRTGDR 193

## RESULT 2

J00173  
 erythropoietin precursor - crab-eating macaque  
 C:Species: Macaca fascicularis (crab-eating macaque)  
 C:Date: 07-Sep-1990 #sequence\_revision 15-Nov-1996 #text\_change 22-Jun-1999

C:Accession: J00173  
 R:Lin. F.K.; Lin. C.H.; Lat. P.H.; Browne, J.K.; Egitte, J.C.; Smalling, R.; Fox, G.M.; C  
 A:Title: Monkey erythropoietin gene: cloning, expression and comparison with the human  
 A:Reference number: J00173; MUID:87055236; PMID:2877922  
 A:Accession: J00173  
 A:Molecule type: mRNA  
 A:Residues: 1-192 <LIN>  
 A:Cross-references: GB:M18189; GB:M15818; GB:M15819; GB:M18188; NID:9342093; PIDN:AAA368  
 A:Experimental source: kidney  
 C:Comment: This protein is the principal hormone involved in the regulation of erythrocy  
 C:Comment: Erythropoietin is produced by kidney or liver of adult mammals and by liver c  
 C:Function:  
 A:Description: the primary inducer of erythrocyte formation  
 C:Superfamily: erythropoietin  
 C:Keywords: erythropoiesis; glycoprotein; hormone; kidney; liver  
 F:1-27/Domain: signal sequence #status predicted <SIG>  
 F:28-192/Product: erythropoietin #status predicted <MAT>  
 F:34-187,56-60/Disulfide bonds: #status predicted  
 F:51,65,110/Binding site: carbohydrate (Asn) (covalent) #status predicted  
 F:152/Binding site: carbohydrate (Ser) (covalent) #status predicted

Query Match 89.0%; Score 881.5; DB 1; Length 192;  
 Best Local Similarity 89.6%; Pred. No. 9,6e-78;  
 Matches 173; Conservative 8; Mismatches 11; Indels 1; Gaps 1;

QY 1 MGVHCPAMWLWLLSLSPGLPVLGAPPRILICDSRYLERLYLLEAKENITTCACHC 60  
 DB 1 MGVHCPAMWLWLLSLSPGLPVLGAPPRILICDSRYLERLYLLEAKENITTCACHC 60  
 QY 61 SLNENITVPDTRKYNFYAMKRNKXSXQAAVEWOGALLSEAVLRGQALLVNSSQPEPQL 120  
 DB 61 SLNENITVPDTRKYNFYAMKRNKXSXQAAVEWOGALLSEAVLRGQALLVNSSQPEPQL 120  
 QY 121 HVDAVSGLSRLTTLRLALGAQKEAISPDDAASAPLRTITADTRFKLFRVYSNFLRGKL 180  
 DB 121 HVDAVSGLSRLTTLRLALGAQKEAISPDDAASAPLRTITADTRFKLFRVYSNFLRGKL 180  
 QY 181 KLYTGEACRTGDR 193  
 DB 181 KLYTGEACRTGDR 193

QY 181 KLYTGEACRTGDR 193  
 DB 180 KLYTGEACRTGDR 192

## RESULT 3

erythropoietin precursor - rhesus macaque  
 C:Species: Macaca mulatta (rhesus macaque)  
 C:Date: 02-Aug-1996 #sequence\_revision 15-Nov-1996 #text\_change 22-Jun-1999

C:Accession: I46613  
 R:Men. D.; Boissel, J.  
 A:Title: Erythropoietin structure-function relationships: High degree of sequence hom  
 A:Reference number: I46613; MUID:93372347; PMID:8364201  
 A:Accession: I46613  
 A:Status: preliminary; translated from GB/EMBL/DBJ

A:Molecule type: mRNA  
 A:Residues: 1-192 <RES>  
 A:Cross-references: GB:L10609; NID:9342095; PIDN:AAA36842.1; PID:9342096  
 C:Comment: Erythropoietin is produced by kidney or liver of adult mammals and by live  
 C:Function:  
 A:Description: the primary inducer of erythrocyte formation  
 C:Superfamily: erythropoietin  
 C:Keywords: erythropoiesis; glycoprotein; hormone; kidney; liver  
 F:1-27/Domain: signal sequence #status predicted <SIG>  
 F:28-192/Product: erythropoietin #status predicted <MAT>  
 F:34-187,56-60/Disulfide bonds: #status predicted  
 F:51,65,110/Binding site: carbohydrate (Asn) (covalent) #status predicted  
 F:152/Binding site: carbohydrate (Ser) (covalent) #status predicted

Query Match 88.7%; Score 879.5; DB 1; Length 192;  
 Best Local Similarity 89.1%; Pred. No. 1.5e-77;  
 Matches 172; Conservative 9; Mismatches 11; Indels 1; Gaps 1;

QY 1 MGVHCPAMWLWLLSLSPGLPVLGAPPRILICDSRYLERLYLLEAKENITTCACHC 60  
 DB 1 MGVHCPAMWLWLLSLSPGLPVLGAPPRILICDSRYLERLYLLEAKENITTCACHC 60  
 QY 61 SLNENITVPDTRKYNFYAMKRNKXSXQAAVEWOGALLSEAVLRGQALLVNSSQPEPQL 120  
 DB 61 SLNENITVPDTRKYNFYAMKRNKXSXQAAVEWOGALLSEAVLRGQALLVNSSQPEPQL 120  
 QY 121 HVDAVSGLSRLTTLRLALGAQKEAISPDDAASAPLRTITADTRFKLFRVYSNFLRGKL 180  
 DB 121 HVDAVSGLSRLTTLRLALGAQKEAISPDDAASAPLRTITADTRFKLFRVYSNFLRGKL 180  
 QY 181 KLYTGEACRTGDR 193  
 DB 180 KLYTGEACRTGDR 192

## RESULT 4

erythropoietin precursor - cat (fragment)  
 C:Species: Felis silvestris catus (domestic cat)  
 C:Date: 16-Aug-1996 #sequence\_revision 15-Nov-1996 #text\_change 22-Jun-1999

C:Accession: I46083  
 R:Men. D.; Boissel, J.  
 A:Title: Erythropoietin structure-function relationships: High degree of sequence hom  
 A:Reference number: I46083; MUID:93372347; PMID:8364201  
 A:Accession: I46083  
 A:Status: translated from GB/EMBL/DBJ

A:Molecule type: mRNA  
 A:Residues: 1-188 <MEN>  
 A:Cross-references: GB:L10606; NID:9163820; PIDN:AAA30807.1; PID:9163821  
 C:Comment: Erythropoietin is produced by kidney or liver of adult mammals and by live  
 C:Function:  
 A:Description: the primary inducer of erythrocyte formation  
 C:Superfamily: erythropoietin  
 C:Keywords: erythropoiesis; glycoprotein; hormone; kidney; liver  
 F:1-22/Domain: signal sequence (fragment) #status predicted <SIG>



A:Accession: I46578  
A:Status: preliminary; translated from GB/EMBL/DBJ  
A:Molecule type: mRNA  
A:Residues: 1-190 <MEN>  
A:Cross-references: GB:J10607; NID:J164445; PIDN:AAA31029.1; PID:g164446  
A:Superfamily: erythropoietin

Query Match	75.5%;	Score 748.5;	DB 2;	Length 190;
Best Local Similarity	81.2%;	Pred. No. 6.8e-65;		
Matches 155;	Conservative 7;	Mismatches 26;	Indels 3;	Gaps 2

[illegible]

## RESULT 8

erythropoietin precursor - mouse  
C:Species: Mus musculus (house mouse)  
C:Date: 25-Oct-1997 #sequence\_revision 15-Nov-1996 #text\_change 22-Jun-1999  
C:Accession: A24902; A24901  
R:Shoemaker, C.B.; Miltsock, L.D.  
M:1. Cell. Biol. 6, 849-858, 1986  
A:Title: Murine erythropoietin gene: cloning, expression, and human gene homology.  
A:Reference number: A24902; MUID:87039105; PMID:3773894  
A:Accession: A24902  
A:Molecule type: DNA  
A:Residues: 1-192 <SHO>  
A:Note: the authors translated the codon TTA for residue 12 as Phe, TTA for residue 43 as  
R:McDonald, J.D.; Lin, F.K.; Goldwasser, E.  
M:1. Cell. Biol. 6, 842-848, 1986  
A:Title: Cloning, sequencing, and evolutionary analysis of the mouse erythropoietin gene  
A:Reference number: A24901; MUID:87039104; PMID:3022133  
A:Accession: A24901  
A:Molecule type: DNA  
A:Residues: 1-67, 'P', 69-192 <MCD>  
A:Cross-references: GB:M2930; NID:q193086; PID:AAA37570.1; PID:q387152  
C:Comment: Erythropoietin is produced by kidney or liver of adult mammals and by liver C  
C:Genetics:  
A:Introns: 5/1; 52/3; 81/3; 141/3  
C:Function:  
A:Description: the primary inducer of erythrocyte formation  
C:Superfamily: erythropoietin  
C:Keywords: erythropoiesis; glycoprotein; hormone; kidney; liver  
F:1-26/Domain: signal sequence #status predicted <SIG>  
F:27-192/Product: erythropoietin #status predicted <MAT>  
F:33-187/55-165/Disulfide bonds: #status predicted  
F:50,64,109/Binding site: carbohydrate (Asn) (covalent) #status predicted

Query Match	74.5%;	Score 738.5;	DB 1;	Length 192;
Best Local Similarity	76.7%;	Pred. No. 6.4e-64;		
Matches 148;	Conservative 15;	Mismatches 29;	Indels 1;	Gaps 1;

[illegible]

QY	QY	QY	QY
12	HYKAAVSGRSITLTTLRALGAQKKAISPDDAASAPLTITPADFERKLFRYASNFELGKL	180	
11		179	
10		178	
9		177	
8		176	
7		175	
6		174	
5		173	
4		172	
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## RESULT 9

erythropoietin - rabbit  
C.Species: Oryctolagus cuniculus (domestic rabbit)  
C.Date: 30-Sep-2001 #sequence\_revision 30-Sep-2001 #text\_change 22-Oct-2001  
C.Accession: J07699  
R.Vitalita, A.; Wu, D.; Margallth, M.; Hobart, P.  
Biochem. Biophys. Res. Commun. 284, 823-827, 2001  
A.Title: Rabbit EPO gene and cDNA: Expression of rabbit EPO after intramuscular injection  
A.Reference number: J07699; M01D:2129082; PMID:1159576  
A.Contents: Kidney  
A.Accession: J07699  
A.Molecule type: DNA  
A.Residues: 1-195 <VIL>  
A.Cross-references: GB:AF290943  
C.Comment: This protein, a heavily glycosylated 34k protein produced in the fetal liver cells.

Query Match	73.6%;	Score 729;	DB 2;	Length 195;
Best Local Similarity	77.9%;	Pred. No. 5.4e-63;		
Matches 152;	Conservative 14;	Mismatches 27;	Indels 2;	Gaps 2

**QY** 60 CSLNENITVDPTRKVFYAMKRNXSXQQAWEVMQGLALLSEAVLRGALLVNSSQPWELQ 119  
 : : : : : : : : : : : : : : : : : : : :  
**Db** 61 CSLGENITVPDTRKYNNHHMKRSEAGRHAWEVMQGLALLSEAMLRSQLANNSSQLPETIQ 120  
 : : : : : : : : : : : : : : : : : : : :  
**QY** 120 LHYDKAVSGLSRLSTTLIRLGAQAKAISPDAH-SAAPLRTTADTRFKLFRIYSNFLRG 178  
 : : : : : : : : : : : : : : : : : : : :  
**Db** 121 VHYDKAVSGLSRSLSTILIRALGYQKAESPPEASSAAPLRTVAADTLCKLFRIYSNFLRG 180  
 : : : : : : : : : : : : : : : : : : : :  
**QY** 179 KKLTYGEACRTGDR 193  
 ||||| |  
**Db** 181 KKLTYGEACRRGDR 195  
 ||||| |

## RESULT 10

erythropoietin - dog (fragment)  
 C:Species: Canis lupus familiaris (dog)  
 C:Date: 21-Feb-1997 #sequence\_revision 21-Feb-1997 #text\_change 23-Jul-1999  
 C:Accession: I46199  
 R:Men, D.: Bolissel, J.  
 B:cod 82, 1507-1516, 1993  
 A:Title: Erythropoietin structure-function relationships: High degree of sequence hom  
 A:Reference number: I46083; MUID:93372347; PMID:8364201  
 A:Accession: I46199  
 A:Status: preliminary; translated from GB/EMBL/DBJ  
 A:Molecule type: mRNA  
 A:Residues: 1-175 <MEN>  
 A:Cross-references: GB:IJ3027; NID:g290087; PIDN:AAA30842.1; PID:g9552347  
 A:Superfamily: erythropoietin

Query Match	70.6%;	Score 699.5;	DB 2;	Length 175;
Best Local Similarity	80.1%;	Pred. No. 3.4e-60;		
Matches 141;	Conservative 12;	Mismatches 22;	Indels 1;	Gaps 1;









Patent No. 6555343  
GENERAL INFORMATION:  
APPLICANT: Desauvage, Frederick  
TITLE OF INVENTION: No. 6555343e1 chimpanzee erythropoietin (chepo)  
FILE REFERENCE: GENEENT.057CPI  
CURRENT APPLICATION NUMBER: US/09/552.265B  
PRIOR FILING DATE: 2000-04-19  
NUMBER OF SEQ ID NOS: 49  
SOFTWARE: FastSeq for Windows Version 4.0  
SEQ ID NO 36  
LENGTH: 193  
TYPE: PRT  
ORGANISM: Pan troglodytes  
FEATURE:  
NAME/KEY: UNSURE  
LOCATION: 82, 84  
OTHER INFORMATION: Xaa = any amino acid  
US-09-552-265B-36

Query Match 99.3%; Score 984; DB 4; Length 193;  
Best Local Similarity 99.5%; Pred. No. 6.3e-113;  
Matches 192; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

OY 1 MGVECPAMWLMLLSLSLPLGLPYLGAPPRLLICDSRYLERYLEAKAEENITTCGAHC 60  
DB 1 MGVECPAMWLMLLSLSLPLGLPYLGAPPRLLICDSRYLERYLEAKAEENITTCGAHC 60  
OY 61 SLNENITVPDTRKVFYAKRNXSXQAAVEWQGLALSEAVLRGQALLVNSSQWPEPIQL 120  
DB 61 SLNENITVPDTRKVFYAKRNXSXQAAVEWQGLALSEAVLRGQALLVNSSQWPEPIQL 120  
OY 121 HDKAVSGLSRLTTLRLGAKKEAISPPDAASAAPLRTITADTFRKLFYYSNPLRGKL 180  
DB 121 HDKAVSGLSRLTTLRLGAKKEAISPPDAASAAPLRTITADTFRKLFYYSNPLRGKL 180  
OY 181 KLYTGEACRTGDR 193  
DB 181 KLYTGEACRTGDR 193

RESULT 3  
US-09-552-265B-35  
Sequence 35, Application US/09552265B  
Patent No. 6555343

GENERAL INFORMATION:  
APPLICANT: Desauvage, Frederick  
TITLE OF INVENTION: No. 6555343e1 chimpanzee erythropoietin (chepo)  
FILE REFERENCE: GENEENT.057CPI  
CURRENT APPLICATION NUMBER: US/09/552.265B  
PRIOR FILING DATE: 2000-04-19  
NUMBER OF SEQ ID NOS: 49  
SOFTWARE: FastSeq for Windows Version 4.0  
SEQ ID NO 35  
LENGTH: 193  
TYPE: PRT  
ORGANISM: Pan troglodytes  
FEATURE:  
NAME/KEY: UNSURE  
LOCATION: 82, 84  
OTHER INFORMATION: Xaa = any amino acid  
US-09-552-265B-35

Query Match 99.2%; Score 983; DB 4; Length 193;  
Best Local Similarity 99.5%; Pred. No. 8.4e-113;  
Matches 192; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

OY 1 MGVECPAMWLMLLSLSLPLGLPYLGAPPRLLICDSRYLERYLEAKAEENITTCGAHC 60  
DB 1 MGVECPAMWLMLLSLSLPLGLPYLGAPPRLLICDSRYLERYLEAKAEENITTCGAHC 60  
OY 61 SLNENITVPDTRKVFYAKRNXSXQAAVEWQGLALSEAVLRGQALLVNSSQWPEPIQL 120  
DB 61 SLNENITVPDTRKVFYAKRNXSXQAAVEWQGLALSEAVLRGQALLVNSSQWPEPIQL 120  
OY 121 HDKAVSGLSRLTTLRLGAKKEAISPPDAASAAPLRTITADTFRKLFYYSNPLRGKL 180  
DB 121 HDKAVSGLSRLTTLRLGAKKEAISPPDAASAAPLRTITADTFRKLFYYSNPLRGKL 180  
OY 181 KLYTGEACRTGDR 193  
DB 181 KLYTGEACRTGDR 193

RESULT 4  
US-09-552-265B-37  
Sequence 37, Application US/09552265B  
Patent No. 6555343

GENERAL INFORMATION:  
APPLICANT: Desauvage, Frederick  
TITLE OF INVENTION: No. 6555343e1 chimpanzee erythropoietin (chepo)  
FILE REFERENCE: GENEENT.057CPI  
CURRENT APPLICATION NUMBER: US/09/552.265B  
PRIOR FILING DATE: 2000-04-19  
NUMBER OF SEQ ID NOS: 49  
SOFTWARE: FastSeq for Windows Version 4.0  
SEQ ID NO 37  
LENGTH: 193  
TYPE: PRT  
ORGANISM: Pan troglodytes  
FEATURE:  
NAME/KEY: UNSURE  
LOCATION: 82, 84  
OTHER INFORMATION: Xaa = any amino acid  
US-09-552-265B-37

Query Match 98.9%; Score 980; DB 4; Length 193;  
Best Local Similarity 99.0%; Pred. No. 2e-112;  
Matches 191; Conservative 2; Mismatches 0; Indels 0; Gaps 0;

OY 1 MGVECPAMWLMLLSLSLPLGLPYLGAPPRLLICDSRYLERYLEAKAEENITTCGAHC 60  
DB 1 MGVECPAMWLMLLSLSLPLGLPYLGAPPRLLICDSRYLERYLEAKAEENITTCGAHC 60  
OY 61 SLNENITVPDTRKVFYAKRNXSXQAAVEWQGLALSEAVLRGQALLVNSSQWPEPIQL 120  
DB 61 SLNENITVPDTRKVFYAKRNXSXQAAVEWQGLALSEAVLRGQALLVNSSQWPEPIQL 120  
OY 121 HDKAVSGLSRLTTLRLGAKKEAISPPDAASAAPLRTITADTFRKLFYYSNPLRGKL 180  
DB 121 HDKAVSGLSRLTTLRLGAKKEAISPPDAASAAPLRTITADTFRKLFYYSNPLRGKL 180  
OY 181 KLYTGEACRTGDR 193  
DB 181 KLYTGEACRTGDR 193

RESULT 5  
US-07-903-220-1  
Sequence 1, Application US/07903220  
Patent No. 5322837

GENERAL INFORMATION:  
APPLICANT: Hewick, Rodney M.  
TITLE OF INVENTION: METHOD FOR THE PURIFICATION OF  
ERYTHROPOIETIN AND ERYTHROPOIETIN COMPOSITION

ADDRESS: BERKSKIN & PARK  
STREET: 40 King Street West  
CITY: Toronto  
STATE: Ontario  
COUNTRY: Canada  
ZIP: M5H 3Y2

```

Query Match 98.2%; Score 973; DB 4; Length 193;
Best Local Similarity 97.9%; Pred. No. 1,46-111;
Matches 189; Conservative 4; Indels 0; Gaps 0;
OY 1 MGVECPAMLMILLSLSPGLPYLGAPRLICDSVLERLYLLEAKENITTCAGENC 60
|||||

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```
Db      1  MGVHECPAMWLMLLSLPLGLPYLGAPPRILICDSRVLELYLLEAKAEENITTCGAHC 60
        61  SLNENITVPDKRVNFYANKRNKXSQAQAVEWQGLALLSEAVLRGQALLVNSSQPEPIQL 120
        61  SLNENITVPDKRVNFYANKRNKXSQAQAVEWQGLALLSEAVLRGQALLVNSSQPEPIQL 120
Qy      121  HYDKAVSGLSRLTTLRLALGAQKEAISPDDAASAPLRTITADTRKLFRRYSNPLRGKL 180
        121  HYDKAVSGLSRLTTLRLALGAQKEAISPDDAASAPLRTITADTRKLFRRYSNPLRGKL 180
Db      181  KLYTGEACRTGDR 193
        181  KLYTGEACRTGDR 193
```

```
RESULT 8
US-09-552-265B-4
; Sequence 4, Application US/09552265B
; Patent No. 655343
; GENERAL INFORMATION:
; APPLICANT: Desauvage, Frederick
; APPLICANT: Henner, Dennis, J.
; TITLE OF INVENTION: No. 655343el chimpanzee erythropoietin (chepo)
; FILE REFERENCE: GENEENT.057CPI
; CURRENT FILING DATE: 2000-04-19
; PRIOR APPLICATION NUMBER: US 09/307307
; PRIOR FILING DATE: 1999-05-17
; NUMBER OF SEQ ID NOS: 49
; SOFTWARE: FastSeq for Windows Version 4.0
; SEQ ID NO 4
; LENGTH: 193
; TYPE: PRT
; ORGANISM: Homo sapiens
US-09-552-265B-4
```

```
Query Match      98.2%; Score 973; DB 4; Length 193;
Best Local Similarity 97.9%; Pred. No. 1.4e-11;
Matches 189; Conservative 0; Mismatches 4; Indels 0; Gaps 0;
```

```
Qy      1  MGVHECPAMWLMLLSLPLGLPYLGAPPRILICDSRVLELYLLEAKAEENITTCGAHC 60
        1  MGVHECPAMWLMLLSLPLGLPYLGAPPRILICDSRVLELYLLEAKAEENITTCGAHC 60
Db      61  SLNENITVPDKRVNFYANKRNKXSQAQAVEWQGLALLSEAVLRGQALLVNSSQPEPIQL 120
        61  SLNENITVPDKRVNFYANKRNKXSQAQAVEWQGLALLSEAVLRGQALLVNSSQPEPIQL 120
Qy      121  HYDKAVSGLSRLTTLRLALGAQKEAISPDDAASAPLRTITADTRKLFRRYSNPLRGKL 180
        121  HYDKAVSGLSRLTTLRLALGAQKEAISPDDAASAPLRTITADTRKLFRRYSNPLRGKL 180
Db      181  KLYTGEACRTGDR 193
        181  KLYTGEACRTGDR 193
```

RESULT 9

```
US-09-552-265B-38
; Sequence 38, Application US/09552265B
; Patent No. 655343
; GENERAL INFORMATION:
; APPLICANT: Desauvage, Frederick
; APPLICANT: Henner, Dennis, J.
; TITLE OF INVENTION: No. 655343el chimpanzee erythropoietin (chepo)
; FILE REFERENCE: GENEENT.057CPI
; CURRENT FILING DATE: 2000-04-19
; PRIOR APPLICATION NUMBER: US 09/307307
; PRIOR FILING DATE: 1999-05-17
; NUMBER OF SEQ ID NOS: 49
```

```
; SOFTWARE: FastSeq for Windows Version 4.0
; SEQ ID NO 38
; LENGTH: 193
; TYPE: PRT
; ORGANISM: Pan troglodytes
; FEATURE:
; NAME/KEY: UNSURE
; LOCATION: 83, 85
; OTHER INFORMATION: Xaa = any amino acid
US-09-552-265B-38
```

```
Query Match      97.9%; Score 970; DB 4; Length 193;
Best Local Similarity 97.4%; Pred. No. 3.3e-11;
Matches 188; Conservative 0; Mismatches 5; Indels 0; Gaps 0;
```

```
Qy      1  MGVHECPAMWLMLLSLPLGLPYLGAPPRILICDSRVLELYLLEAKAEENITTCGAHC 60
        1  MGVHECPAMWLMLLSLPLGLPYLGAPPRILICDSRVLELYLLEAKAEENITTCGAHC 60
Db      61  SLNENITVPDKRVNFYANKRNKXSQAQAVEWQGLALLSEAVLRGQALLVNSSQPEPIQL 120
        61  SLNENITVPDKRVNFYANKRNKXSQAQAVEWQGLALLSEAVLRGQALLVNSSQPEPIQL 120
Qy      121  HYDKAVSGLSRLTTLRLALGAQKEAISPDDAASAPLRTITADTRKLFRRYSNPLRGKL 180
        121  HYDKAVSGLSRLTTLRLALGAQKEAISPDDAASAPLRTITADTRKLFRRYSNPLRGKL 180
Db      181  KLYTGEACRTGDR 193
        181  KLYTGEACRTGDR 193
```

RESULT 10

```
US-09-552-265B-40
; Sequence 40, Application US/09552265B
; Patent No. 655343
; GENERAL INFORMATION:
; APPLICANT: Desauvage, Frederick
; APPLICANT: Henner, Dennis, J.
; TITLE OF INVENTION: No. 655343el chimpanzee erythropoietin (chepo)
; FILE REFERENCE: GENEENT.057CPI
; CURRENT FILING DATE: 2000-04-19
; PRIOR APPLICATION NUMBER: US 09/307307
; PRIOR FILING DATE: 1999-05-17
; NUMBER OF SEQ ID NOS: 49
; SOFTWARE: FastSeq for Windows Version 4.0
; SEQ ID NO 40
; LENGTH: 193
; TYPE: PRT
; ORGANISM: Pan troglodytes
; FEATURE:
; NAME/KEY: UNSURE
; LOCATION: 83, 85
; OTHER INFORMATION: Xaa = any amino acid
US-09-552-265B-40
```

```
Query Match      97.9%; Score 970; DB 4; Length 193;
Best Local Similarity 97.4%; Pred. No. 3.3e-11;
Matches 188; Conservative 0; Mismatches 5; Indels 0; Gaps 0;
```

```
Qy      1  MGVHECPAMWLMLLSLPLGLPYLGAPPRILICDSRVLELYLLEAKAEENITTCGAHC 60
        1  MGVHECPAMWLMLLSLPLGLPYLGAPPRILICDSRVLELYLLEAKAEENITTCGAHC 60
Db      61  SLNENITVPDKRVNFYANKRNKXSQAQAVEWQGLALLSEAVLRGQALLVNSSQPEPIQL 120
        61  SLNENITVPDKRVNFYANKRNKXSQAQAVEWQGLALLSEAVLRGQALLVNSSQPEPIQL 120
Qy      121  HYDKAVSGLSRLTTLRLALGAQKEAISPDDAASAPLRTITADTRKLFRRYSNPLRGKL 180
        121  HYDKAVSGLSRLTTLRLALGAQKEAISPDDAASAPLRTITADTRKLFRRYSNPLRGKL 180
Db      181  KLYTGEACRTGDR 193
        181  KLYTGEACRTGDR 193
```

Qy	181	KLYTGEACRTGDR	193
Db	181	KLYTGEACRTGDR	193

```

RESULT 11
US-09-552-265B-5
: Sequence 5, Application US/09552265B
: Patent No. 655343
: GENERAL INFORMATION:
: APPLICANT: Desauvage, Frederick
: APPLICANT: Henner, Dennis, J.
: TITLE OF INVENTION: No. 6555343el chimpanzee erythropoietin (chepo)
: TITLE OF INVENTION: polypeptides and nucleic acids encoding the same
: FILE REFERENCE: GENENT 057Cp1
: CURRENT APPLICATION NUMBER: US/09/552,265B
: CURRENT FILING DATE: 2000-04-19
: PRIOR APPLICATION NUMBER: US 09/307307
: PRIOR FILING DATE: 1999-05-17
: NUMBER OF SEQ ID NOS: 49
: SOFTWARE: FastSeq for Windows Version 4.0
: SEQ ID NO 5
: LENGTH: 193
: TYPE: PRT
: ORGANISM: Pan troglodytes
: US-09-552-265B-5

```

```

RESULT 12
US-09-552-265H-39
: Sequence 39, Application US/09552265B
: Patent No. 655343
: GENERAL INFORMATION:
: APPLICANT: Desauvage, Frederick
: APPLICANT: Henner, Dennis, J.
: TITLE OF INVENTION: No. 655343el chimpanzee erythropoietin (chepo)
: FILE REFERENCE: GENENT-057CPI
: CURRENT APPLICATION NUMBER: US/09/552,265B
: PRIOR FILING DATE: 2000-04-19
: PRIOR APPLICATION NUMBER: US 09/307307
: NUMBER OF SEQ ID NOS: 49
: SOFTWARE: FastSeq for Windows Version 4.0
: SEQ ID NO 39
: LENGTH: 193
: TYPE: PRT
: ORGANISM: Pan troglodytes
: FEATURE:
: NAME/KEY: UNSURE
: LOCATION: 83, 85
: OTHER INFORMATION: Xaa = any amino acid

```

```

US-09-552-2658-39
Query Match          97.5%;   Score 966;   DB 4;   Length 193;
Best Local Similarity 96.9%;   Pred. No. 1e-110;
Matches 187; Conservative 1; Mismatches 5; Indels 0; Gaps 0;

```

```

RESULT 13
US-09-552-265B-41
: Sequence 41: Application US/09552265B
: Patent No. 6553343
: GENERAL INFORMATION:
: APPLICANT: Desauvage, Frederick
: APPLICANT: Henner, Dennis, J.
: TITLE OF INVENTION: No. 6555343el chimpanzee erythropoietin (chepo)
: TITLE OF INVENTION: polypeptides and nucleic acids encoding the same
: FILE REFERENCE: GENENT.057CPI
: CURRENT APPLICATION NUMBER: US/09/552,265B
: PRIOR FILING DATE: 2000-04-19
: PRIOR FILING DATE: 1999-05-17
: NUMBER OF SEQ ID NOS: 49
: SOFTWARE: FastSeq for Windows Version 4.0
: SEQ ID NO: 41
: LENGTH: 193
: TYPE: PRT
: ORGANISM: Pan troglodytes
: FEATURE:
: NAME/KEY: UNSURE
: LOCATION: 83, 85
: OTHER INFORMATION: Xaa = any amino acid
US-09-552-265B-41

Query Match          97.5%: Score 966; DB 4; Length 193;
Best Local Similarity 96.9%: Pred. No. 1e-110;
Matches 187; Conservative 1; Mismatches 5; Indels 0; Gaps 0;

QY      1  MGVEHCAPAMLLLSLSTSLPLGLPVLGAPPLICDSRYLERYLLEAKAEENITTCACHC 60
Db      1  MGVEHCAPAMLLLSLSTSLPLGLPVLGAPPLICDSRYLERYLLEAKAEENITTCACHC 60

QY      61  SLNENITVPPTKVFYAMKRKXSKQAVEVWQGLALSEAVLRGALLVNSSQPEPIQL 120
Db      61  SLNENITVPPTKVFYAMKRKXSKQAVEVWQGLALSEAVLRGALLVNSSQPEPIQL 120

QY      121  HYDAVAVGLSLTTLTALGAKQEAISPPDAASAPLTITADTFRKLFRVYSNFLRGKL 180
Db      121  HYDAVAVGLSLTTLTALGAKKKAISPPDAASAPLTITADTFRKLFRVYSNFLRGKL 180

QY      181  KLYTGEACRTGDR 193
Db      181  KLYTGEACRTGDR 193

RESULT 14
US-09-552-265B-42
Sequence 42, Application US/09552265B

```

```
; Patent No. 6555343
; GENERAL INFORMATION:
; APPLICANT: Desauvage, Frederick
; APPLICANT: Henner, Dennis, J.
; TITLE OF INVENTION: No. 6555343el chimpanzee erythropoietin (chepo)
; FILE REFERENCE: GENEENT.057Cp1
; CURRENT APPLICATION NUMBER: US/09/552,265B
; CURRENT FILING DATE: 2000-04-19
; PRIOR APPLICATION NUMBER: US 09/307307
; PRIOR FILING DATE: 1999-05-17
; NUMBER OF SEQ ID NOS: 49
; SOFTWARE: FastSeq for Windows Version 4.0
; SEQ ID NO 42
; LENGTH: 193
; TYPE: PRT
; ORGANISM: Pan troglodytes
; FEATURE:
; NAME/KEY: UNSURE
; LOCATION: 84, 86
; OTHER INFORMATION: Xaa = any amino acid
US-09-552-265B-42
```

```
Query Match          97.4%; Score 965; DB 4; Length 193;
Best Local Similarity 97.4%; Pred. No. 1.4e-110;
Matches 188; Conservative 1; Mismatches 4; Indels 0; Gaps 0;
```

```
OY      1  MGVHECPAMWLMLLSLSLPLGLPYLGAPPRLLICDSRVLERLYLEAKAEANTTGCACHC 60
Db      1  MGVHECPAMWLMLLSLSLPLGLPYLGAPPRLLICDSRVLERLYLEAKAEANTTGCACHC 60
OY      61  SLNENITVPDTRKVNFYAMKRNXSXQAAVEVWQGLALLSEAVLRGQALLVNSSQPEPIQL 120
Db      61  SLNENITVPDTRKVNFYAMKRNXSXQAAVEVWQGLALLSEAVLRGQALLVNSSQPEPIQL 120
OY      121  HYDKAVSGLRSLTTLRLALGAOKEAISPDDAASAPLRTITADTRKLFPRVYSNFLRGKL 180
Db      121  HYDKAVSGLRSLTTLRLALGAOKEAISPDDAASAPLRTITADTRKLFPRVYSNFLRGKL 180
OY      181  KLYTGEACRTGDR 193
Db      181  KLYTGEACRTGDR 193
```

## RESULT 15

```
US-09-552-265B-44
; Sequence 44, Application US/09552265B
; Patent No. 6555343
; GENERAL INFORMATION:
; APPLICANT: Desauvage, Frederick
; APPLICANT: Henner, Dennis, J.
; TITLE OF INVENTION: No. 6555343el chimpanzee erythropoietin (chepo)
; FILE REFERENCE: GENEENT.057Cp1
; CURRENT APPLICATION NUMBER: US/09/552,265B
; CURRENT FILING DATE: 2000-04-19
; PRIOR APPLICATION NUMBER: US 09/307307
; PRIOR FILING DATE: 1999-05-17
; NUMBER OF SEQ ID NOS: 49
; SOFTWARE: FastSeq for Windows Version 4.0
; SEQ ID NO 44
; LENGTH: 193
; TYPE: PRT
; ORGANISM: Pan troglodytes
; FEATURE:
; NAME/KEY: UNSURE
; LOCATION: 84, 86
; OTHER INFORMATION: Xaa = any amino acid
US-09-552-265B-44
```

```
Query Match          97.3%; Score 964; DB 4; Length 193;
Best Local Similarity 97.4%; Pred. No. 1.8e-110;
Matches 188; Conservative 1; Mismatches 4; Indels 0; Gaps 0;
```

```
OY      1  MGVHECPAMWLMLLSLSLPLGLPYLGAPPRLLICDSRVLERLYLEAKAEANTTGCACHC 60
Db      1  MGVHECPAMWLMLLSLSLPLGLPYLGAPPRLLICDSRVLERLYLEAKAEANTTGCACHC 60
OY      61  SLNENITVPDTRKVNFYAMKRNXSXQAAVEVWQGLALLSEAVLRGQALLVNSSQPEPIQL 120
Db      61  SLNENITVPDTRKVNFYAMKRNXSXQAAVEVWQGLALLSEAVLRGQALLVNSSQPEPIQL 120
OY      121  HYDKAVSGLRSLTTLRLALGAOKEAISPDDAASAPLRTITADTRKLFPRVYSNFLRGKL 180
Db      121  HYDKAVSGLRSLTTLRLALGAOKEAISPDDAASAPLRTITADTRKLFPRVYSNFLRGKL 180
OY      181  KLYTGEACRTGDR 193
Db      181  KLYTGEACRTGDR 193
```

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Search completed: September 8, 2003, 15:04:08
Job time : 13.2862 secs
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GenCore version 5.1.6  
Copyright (c) 1993 - 2003 CompuGen Ltd.

OM protein - protein search, using sw model

Run on: September 8, 2003, 14:33:36 : Search time 40 Seconds

(without alignments)  
765.856 Million cell updates/sec

Title: US-09-813-775c-34

Perfect score: 991

Sequence: 1 MGVHECPAMWLLSLSLP.....NFLRCKLKYTGACRTGDR 193

Scoring table: BLOSUM62

Gapop 10.0 , Gapext 0.5

Searched: 1107863 seqs, 158726573 residues 1107863

Total number of hits satisfying chosen parameters:

Minimum DB seq length: 0

Maximum DB seq length: 200000000

Post-processing: Minimum Match 0%

Maximum Match 100%

Listing first 45 summaries

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Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

#### SUMMARIES

Result No.	Score	Query Match	Length	ID	Description
1	987	99.6	193	22	AAAB35002
2	987	99.6	193	23	AAE29323
3	984	99.3	193	22	AAAB35004
4	984	99.3	193	23	AAE29325
5	983	99.2	193	22	AAAB35003
6	983	99.2	193	23	AAE29324
7	980	98.9	193	22	AAAB35005
8	980	98.9	193	23	AAE29326
9	974	98.3	193	21	AAV94536

10	973	98.2	193	6	AAE50300	Human erythropoietin
11	973	98.2	193	8	AAE70256	Sequence of human
12	973	98.2	193	15	AAE65499	Human prepro-eryth
13	973	98.2	193	16	AAE81982	Human erythropoiet
14	973	98.2	193	16	AAE71137	Human erythropoiet
15	973	98.2	193	16	AAE74141	Human erythropoiet
16	973	98.2	193	17	AAE98397	Human erythropoiet
17	973	98.2	193	21	AAE94530	Human erythropoiet
18	973	98.2	193	21	AAE93638	Amino acid sequenc
19	973	98.2	193	21	AAE99704	Human non-glycosyl
20	973	98.2	193	21	AAE43398	Human erythropoiet
21	973	98.2	193	22	AAE85573	Human erythropoiet
22	973	98.2	193	22	AAE34978	Human erythropoiet
23	973	98.2	193	23	AAE29329	Chimpanzee erythro
24	973	98.2	193	23	AAE15341	Human erythropoiet
25	973	98.2	193	24	AAE32131	Human erythropoiet
26	973	98.2	194	22	AAE34977	Chimpanzee erythro
27	973	98.2	330	13	AAE23076	Epo:IL-3 short, re
28	973	98.2	349	13	AAE23079	Epo:IL-3 flex, rec
29	973	98.2	376	20	AAE99360	Human erythropoiet
30	970	97.9	193	7	AAE60598	Open reading frame
31	970	97.9	193	16	AAE74560	Erythropoietin. H
32	970	97.9	193	21	AAE94531	Human erythropoiet
33	970	97.9	193	22	AAE35006	Chimpanzee erythro
34	970	97.9	193	22	AAE35008	Chimpanzee erythro
35	970	97.9	193	23	AAE29327	Chimpanzee erythro
36	970	97.9	193	23	AAE29329	Chimpanzee erythro
37	969	97.8	193	16	AAE81986	Erythropoietin (AI
38	969	97.8	193	21	AAE94532	Human erythropoiet
39	969	97.8	193	21	AAE81913	Human EPO protein
40	969	97.8	193	23	AAE29300	Chimpanzee erythro
41	968	97.7	220	23	AAE79939	Human erythropoiet
42	967	97.6	193	18	AAE14143	Erythropoietin var
43	967	97.6	193	19	AAE58400	Human erythropoiet
44	967	97.6	193	22	AAE34979	Chimpanzee erythro
45	966	97.5	193	12	AAE11859	Erythropoietin ana

#### ALIGNMENTS

RESULT 1

AAAB35002

ID AAB35002 standard: Protein: 193 AA.

AC AAB35002:

XX

XX 27-MAR-2001 (first entry)

XX

DE Chimpanzee erythropoietin fragment SEQ ID NO: 34.

XX

KW Chimpanzee; erythropoietin; Epo: hybridisation probe; gene therapy;

KW mapping; therapeutic agent.

XX

OS Pan sp.

XX

PN WO2000068376-A1.

XX

PD 16-NOV-2000.

XX

XX

PF 05-MAY-2000; 2000WO-US12370.

XX

PR 07-MAY-1999; 99US-0307307.

XX

PR 28-MAR-2000; 2000US-0307307.

XX

XX (GETH ) GENENTECH INC.

XX

XX Desauvage F, Henner DJ;

XX

XX WPI; 2001-007393/01.

XX

XX Nucleic acids encoding chimpanzee erythropoietin, useful for treatment

PT of e.g. anemia, also derived proteins, antibodies and modulators -

XX Claim 35; Page 96; 109pp; English.  
PS  
XX  
CC The present invention provides the coding and protein sequences of  
CC Chimpazee erythropoietin (EPO). These sequences can be used in gene  
CC therapy, to block the activity of EPO, as hybridisation probes, in  
CC genetic and chromosome mapping and as therapeutic agents.  
XX  
SQ Sequence 193 AA:  
Query Match 99.6%; Score 987; DB 22; Length 193;  
Best Local Similarity 100.0%; Pred. No. 1.9e-99;  
Matches 193; Conservative 0; Mismatches 0; Indels 0; Gaps 0;  
OY 1 MGVECPAMLMLLSLSLPLGLPYLGAPPRICDSRYLERLYLEAKAEENITTCACAC 60  
DB 1 MGVECPAMLMLLSLSLPLGLPYLGAPPRICDSRYLERLYLEAKAEENITTCACAC 60  
OY 61 SLNENITVPDTKRVNFYARKRNKXSXQAVEWOGALLSEAVLRGALLVNSSQPEPIQL 120  
DB 61 SLNENITVPDTKRVNFYARKRNKXSXQAVEWOGALLSEAVLRGALLVNSSQPEPIQL 120  
OY 121 HVDKAVSGLSLITLLRALGAQKEAISPDAASAAPLRTITADTFRKLFYVSNFLRGKL 180  
DB 121 HVDKAVSGLSLITLLRALGAQKEAISPDAASAAPLRTITADTFRKLFYVSNFLRGKL 180  
OY 181 KLYTGEACRTGDR 193  
DB 181 KLYTGEACRTGDR 193  
RESULT 2  
AAE29323  
ID AAE29323 standard; Protein: 193 AA.  
AC AAE29323;  
DT 27-JAN-2003 (first entry)  
DE Chimpazee erythropoietin (CHEPO) protein #3.  
XX  
XX Chimpazee; erythropoietin; gene therapy; blood disorder; immunoathesin;  
KM chromosome identification; tissue typing; antihaemic; CHEPO.  
XX  
OS Pan tiroglydyes.  
XX  
XX Key Location/Qualifiers  
FH Misc-difference 82 /label= Unknown  
FT Misc-difference 84 /note= "X is any amino acid except for proline"  
FT Misc-difference 84 /label= Unknown  
FT /note= "X is any amino acid except for proline"  
XX  
XX WO2002/4807-A2.  
XX  
XX 26-SEP-2002.  
XX  
XX 14-FEB-2002; 2002WO-US04773.  
XX  
XX 20-MAR-2001; 2001US-0813775.  
XX  
XX (GETH ) GENENTECH INC.  
XX  
XX Desauvage F, Henner DJ;  
XX  
XX WPI: 2002-759860/82.  
XX  
XX New immunoathesin comprising a chimpazee erythropoietin (CHEPO)  
PT polypeptide, useful for the treatment of blood disorders with low or  
XX defective red blood cell production  
PS Claim 2; Page 82; 120pp; English.

XX  
CC The invention relates to immunoathesins comprising chimpazee  
CC erythropoietin (CHEPO) polypeptide. The invention further relates to  
CC methods using and compositions comprising CHEPO immunoathesins. The  
CC methods and compositions of the present invention are useful for the  
CC treatment of blood disorders characterised by low or defective red  
CC blood cell production. The CHEPO polypeptides may also be used as  
CC molecular weight markers, tissue typing and chromosome identification.  
CC CHEPO DNA is used in gene therapy. The present sequence is chimpazee  
CC erythropoietin protein.  
XX  
SQ Sequence 193 AA:  
Query Match 99.6%; Score 987; DB 23; Length 193;  
Best Local Similarity 100.0%; Pred. No. 1.9e-99;  
Matches 193; Conservative 0; Mismatches 0; Indels 0; Gaps 0;  
OY 1 MGVECPAMLMLLSLSLPLGLPYLGAPPRICDSRYLERLYLEAKAEENITTCACAC 60  
DB 1 MGVECPAMLMLLSLSLPLGLPYLGAPPRICDSRYLERLYLEAKAEENITTCACAC 60  
OY 61 SLNENITVPDTKRVNFYARKRNKXSXQAVEWOGALLSEAVLRGALLVNSSQPEPIQL 120  
DB 61 SLNENITVPDTKRVNFYARKRNKXSXQAVEWOGALLSEAVLRGALLVNSSQPEPIQL 120  
OY 121 HVDKAVSGLSLITLLRALGAQKEAISPDAASAAPLRTITADTFRKLFYVSNFLRGKL 180  
DB 121 HVDKAVSGLSLITLLRALGAQKEAISPDAASAAPLRTITADTFRKLFYVSNFLRGKL 180  
OY 181 KLYTGEACRTGDR 193  
DB 181 KLYTGEACRTGDR 193  
RESULT 3  
AAB35004  
ID AAB35004 standard; Protein: 193 AA.  
AC AAB35004;  
DT 27-MAR-2001 (first entry)  
DE Chimpazee erythropoietin fragment SEQ ID NO: 36.  
XX  
XX Chimpazee; erythropoietin; EPO; hybridisation probe; gene therapy;  
KM mapping; therapeutic agent.  
XX  
OS Pan sp.  
XX  
XX WO200068376-A1.  
XX  
XX 16-NOV-2000.  
XX  
XX 05-MAY-2000; 2000WO-US12370.  
XX  
XX 07-MAY-1999; 99US-0307307.  
XX  
XX 28-MAR-2000; 2000US-0307307.  
XX  
XX (GETH ) GENENTECH INC.  
XX  
XX Desauvage F, Henner DJ;  
XX  
XX WPI: 2001-007393/01.  
XX  
XX Nucleic acids encoding chimpazee erythropoietin, useful for treatment  
PT of e.g. anemia, also derived proteins, antibodies and modulators -  
XX  
XX Claim 35; Page 96; 109pp; English.  
PS  
XX The present invention provides the coding and protein sequences of  
CC chimpazee erythropoietin (EPO). These sequences can be used in gene  
CC therapy, to block the activity of EPO, as hybridisation probes, in  
CC genetic and chromosome mapping and as therapeutic agents.



XX Sequence 193 AA;  
SQ Query Match 99.3%; Score 984; DB 22; Length 193;  
Best Local Similarity 99.5%; Pred. No. 4.1e-99;  
Matches 192; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

QY 1 MGVHECPALWLLSLSLPLGLPVGAPPRILICDSRVLERYLLLEAKENITTCGAERC 60  
Db 1 MGVHECPALWLLSLSLPLGLPVGAPPRILICDSRVLERYLLLEAKENITTCGAERC 60

QY 61 SLNENITVPDTKVNPFYAMKRNKXSOQAVEWOGALLSEAVLRGALLVNSSQPEPQL 120  
Db 61 SLNENITVPDTKVNPFYAMKRNKTXQQAIVEMOGALLSEAVLRGALLVNSSQPEPQL 120

QY 121 HVDKAVSGLRSLTTLRALGAQKEAISPDDASAPLRITADTFERKLFRRVSNFLRGKL 180  
Db 121 HVDKAVSGLRSLTTLRALGAQKEAISPDDASAPLRITADTFERKLFRRVSNFLRGKL 180

QY 181 KLYTGEACRTGDR 193  
Db 181 KLYTGEACRTGDR 193

RESULT 4  
AAE29325  
ID AAE29325 standard; Protein: 193 AA.  
XX AC AAE29325;  
XX DT 27-JAN-2003 (first entry)  
XX DE Chimpanzee erythropoietin (CHEPO) protein #5.  
XX KW Chimpanzee erythropoietin; gene therapy; blood disorder; immunoathesis;  
XX KM chromosome identification; tissue typing; antianaemic; CHEPO.  
XX OS Pan troglodytes.  
XX FH key Location/Qualifiers  
XX FT Misc-difference 82 /label= Unknown  
XX FT /note= "X is any amino acid except for proline"  
XX FT Misc-difference 84 /label= Unknown  
XX FT /note= "X is any amino acid except for proline"  
XX PN WO200274807-A2.  
XX PD 26-SEP-2002.  
XX PF 14-FEB-2002; 2002WO-US04773.  
XX PR 20-MAR-2001; 2001US-0813775.  
XX PA (GETH ) GENENTECH INC.  
XX PI Desauvage F, Henner DJ;  
XX PT WPI: 2002-759880/82.  
XX DR  
XX PT New immunoathesis comprising a chimpanzee erythropoietin (CHEPO)  
XX PT polypeptide, useful for the treatment of blood disorders with low or  
XX PT defective red blood cell production  
XX PS Claim 2; Page 82; 120pp; English.  
XX CC The invention relates to immunoathesis comprising chimpanzee  
XX CC erythropoietin (CHEPO) polypeptide. The invention further relates to  
XX CC methods using and compositions comprising CHEPO immunoathesis. The  
XX CC methods and compositions of the present invention are useful for the  
XX CC treatment of blood disorders characterised by low or defective red  
XX CC blood cell production. The CHEPO polypeptides may also be used as

CC molecular weight markers, tissue typing and chromosome identification.  
CC CHEPO DNA is used in gene therapy. The present sequence is chimpanzee  
CC erythropoietin protein.  
XX  
XX  
SQ Sequence 193 AA;  
SQ Query Match 99.3%; Score 984; DB 23; Length 193;  
Best Local Similarity 99.5%; Pred. No. 4.1e-99;  
Matches 192; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

QY 1 MGVHECPALWLLSLSLPLGLPVGAPPRILICDSRVLERYLLLEAKENITTCGAERC 60  
Db 1 MGVHECPALWLLSLSLPLGLPVGAPPRILICDSRVLERYLLLEAKENITTCGAERC 60

QY 61 SLNENITVPDTKVNPFYAMKRNKXSOQAVEWOGALLSEAVLRGALLVNSSQPEPQL 120  
Db 61 SLNENITVPDTKVNPFYAMKRNKTXQQAIVEMOGALLSEAVLRGALLVNSSQPEPQL 120

QY 121 HVDKAVSGLRSLTTLRALGAQKEAISPDDASAPLRITADTFERKLFRRVSNFLRGKL 180  
Db 121 HVDKAVSGLRSLTTLRALGAQKEAISPDDASAPLRITADTFERKLFRRVSNFLRGKL 180

QY 181 KLYTGEACRTGDR 193  
Db 181 KLYTGEACRTGDR 193

RESULT 5  
AAB35003  
ID AAB35003 standard; Protein: 193 AA.  
XX AC AAB35003;  
XX DT 27-MAR-2001 (first entry)  
XX DE Chimpanzee erythropoietin fragment SEQ ID NO: 35.  
XX KW Chimpanzee erythropoietin; EPO; hybridisation probe; gene therapy;  
XX KM mapping; therapeutic agent.  
XX OS Pan sp.  
XX PN WO200068376-A1.  
XX PD 16-NOV-2000.  
XX PF 05-MAY-2000; 2000WO-US12370.  
XX PR 07-MAY-1999; 99US-0307307.  
XX PR 28-MAR-2000; 2000US-0307307.  
XX PA (GETH ) GENENTECH INC.  
XX PI Desauvage F, Henner DJ;  
XX PT WPI: 2001-007393/01.  
XX DR  
XX PT Nucleic acids encoding chimpanzee erythropoietin, useful for treatment  
XX PT of e.g. anemia, also derived proteins, antibodies and modulators -  
XX PS Claim 35; Page 96; 109pp; English.  
XX CC The present invention provides the coding and protein sequences of  
XX CC chimpanzee erythropoietin (EPO). These sequences can be used in gene  
XX CC therapy, to block the activity of EPO, as hybridisation probes, in  
XX CC genetic and chromosome mapping and as therapeutic agents.  
XX  
SQ Sequence 193 AA;  
SQ Query Match 99.2%; Score 983; DB 22; Length 193;  
Best Local Similarity 99.5%; Pred. No. 5.3e-99;  
Matches 192; Conservative 1; Mismatches 0; Indels 0; Gaps 0;

```
OY 1 MGVECCPAMWLMLLSLSLPLGLPYLGAPPRLLICDSRVLEERYLLLEAKAEENITTCGAHC 60
    |||||||
DB 1 MGVECCPAMWLMLLSLSLPLGLPYLGAPPRLLICDSRVLEERYLLLEAKAEENITTCGAHC 60
OY 61 SLNENITVPDTRKVNRYAMKRNXSXQAAVEVWOGALLLSEAVLRGALLVNSSQPEPIQL 120
    |||||||
DB 61 SLNENITVPDTRKVNRYAMKRNXSXQAAVEVWOGALLLSEAVLRGALLVNSSQPEPIQL 120
OY 121 HYDKAVSGLSRLTTLRLALGAQKEAISPDDAASAPLRTITADTFRKLFRRYSNPLRCKL 180
    |||||||
DB 121 HYDKAVSGLSRLTTLRLALGAQKEAISPDDAASAPLRTITADTFRKLFRRYSNPLRCKL 180
OY 181 KLYTGEACRTGDR 193
    |||||||
DB 181 KLYTGEACRTGDR 193

RESULT 6
AAE29324
ID AAE29324 standard; Protein; 193 AA.
XX
AC AAE29324;
XX
DT 27-JAN-2003 (first entry)
XX
DE Chimpanzee erythropoietin (CHEPO) protein #4.
XX
KM Chimpanzee; erythropoietin; gene therapy; blood disorder; immunoadhesin;
KW chromosome identification; tissue typing; antianaemic; CHEPO.
XX
OS Pan troglodytes.
XX
FH Key Location/Qualifiers
FT Misc-difference 82
    /label= Unknown
FT Misc-difference 84
    /note= "X is any amino acid except for proline"
FT Misc-difference 84
    /label= Unknown
    /note= "X is any amino acid except for proline"
PN WO200274807-A2.
XX
PD 26-SEP-2002.
XX
PF 14-FEB-2002; 2002WO-US04773.
XX
PR 20-MAR-2001; 2001US-0813775.
XX
PA (GETH ) GENENTECH INC.
XX
PI Desauvage F, Henner DJ;
XX
DR WPI: 2002-759880/82.
XX
PT New immunoadhesin comprising a chimpanzee erythropoietin (CHEPO)
PS polypeptide, useful for the treatment of blood disorders with low or
    defective red blood cell production
XX
    Claim 2; Page 82; 120pp; English.
XX
CC The invention relates to immunoadhesins comprising chimpanzee
    erythropoietin (CHEPO) polypeptide. The invention further relates to
    methods using and compositions comprising CHEPO immunoadhesins. The
    CC methods and compositions of the present invention are useful for the
    treatment of blood disorders characterised by low or defective red
    blood cell production. The CHEPO polypeptides may also be used as
    molecular weight markers, tissue typing and chromosome identification.
    CC CHEPO DNA is used in gene therapy. The present sequence is chimpanzee
    erythropoietin protein.
XX
SQ Sequence 193 AA;
Query Match 99.2%; Score 983; DB 23; Length 193;
```

```
Best Local Similarity 99.5%; Pred. No. 5.3e-99;
Matches 192; Conservative 1; Mismatches 0; Indels 0; Gaps 0;
OY 1 MGVECCPAMWLMLLSLSLPLGLPYLGAPPRLLICDSRVLEERYLLLEAKAEENITTCGAHC 60
    |||||||
DB 1 MGVECCPAMWLMLLSLSLPLGLPYLGAPPRLLICDSRVLEERYLLLEAKAEENITTCGAHC 60
OY 61 SLNENITVPDTRKVNRYAMKRNXSXQAAVEVWOGALLLSEAVLRGALLVNSSQPEPIQL 120
    |||||||
DB 61 SLNENITVPDTRKVNRYAMKRNXSXQAAVEVWOGALLLSEAVLRGALLVNSSQPEPIQL 120
OY 121 HYDKAVSGLSRLTTLRLALGAQKEAISPDDAASAPLRTITADTFRKLFRRYSNPLRCKL 180
    |||||||
DB 121 HYDKAVSGLSRLTTLRLALGAQKEAISPDDAASAPLRTITADTFRKLFRRYSNPLRCKL 180
OY 181 KLYTGEACRTGDR 193
    |||||||
DB 181 KLYTGEACRTGDR 193

RESULT 7
AAB35005
ID AAB35005 standard; Protein; 193 AA.
XX
AC AAB35005;
XX
DT 27-MAR-2001 (first entry)
XX
DE Chimpanzee erythropoietin fragment SEQ ID NO: 37.
XX
KM Chimpanzee; erythropoietin; EPO; hybridisation probe; gene therapy;
KW mapping; therapeutic agent.
XX
OS Pan sp.
XX
PN WO200068376-A1.
XX
PD 16-NOV-2000.
XX
PF 05-MAY-2000; 2000WO-US12370.
XX
PR 07-MAY-1999; 99US-0307307.
XX
PR 28-MAR-2000; 2000US-0307307.
XX
PA (GETH ) GENENTECH INC.
XX
PI Desauvage F, Henner DJ;
XX
DR WPI: 2001-007393/01.
XX
PT Nucleic acids encoding chimpanzee erythropoietin, useful for treatment
PS of e.g. anemia, also derived proteins, antibodies and modulators -
XX
    Claim 35; Page 96; 109pp; English.
XX
CC The present invention provides the coding and protein sequences of
    CC chimpanzee erythropoietin (EPO). These sequences can be used in gene
    therapy, to block the activity of EPO, as hybridisation probes, in
    CC genetic and chromosome mapping and as therapeutic agents.
XX
SQ Sequence 193 AA;
Query Match 98.9%; Score 980; DB 22; Length 193;
Best Local Similarity 99.0%; Pred. No. 1.1e-98;
Matches 191; Conservative 2; Mismatches 0; Indels 0; Gaps 0;
OY 1 MGVECCPAMWLMLLSLSLPLGLPYLGAPPRLLICDSRVLEERYLLLEAKAEENITTCGAHC 60
    |||||||
DB 1 MGVECCPAMWLMLLSLSLPLGLPYLGAPPRLLICDSRVLEERYLLLEAKAEENITTCGAHC 60
OY 61 SLNENITVPDTRKVNRYAMKRNXSXQAAVEVWOGALLLSEAVLRGALLVNSSQPEPIQL 120
    |||||||
DB 61 SLNENITVPDTRKVNRYAMKRNXSXQAAVEVWOGALLLSEAVLRGALLVNSSQPEPIQL 120
```

QY	121	HYDAVSLRLSTLTLLRALGKQKEAISPPDASAPRLRTITADTRKLFRRVSNPLRGL	180
DB	121	HYDAVSLRLSTLTLLRALGKKEAISPPDASAPRLRTITADTRKLFRRVSNPLRGL	180
QY	181	KLYTGEACRTGDR	193
DB	181	KLYTGEACRTGDR	193
RESULT	8		
ID	AAE29326		
XX	AAE29326	standard; Protein: 193 AA.	
AC	AAE29326;		
XX			
DT	27-JAN-2003	(first entry)	
XX			
DE	Chimpanzee erythropoietin (CHEPO) protein #6.		
XX			
KW	Chimpanzee: erythropoietin; gene therapy; blood disorder; immunoathesis;		
XX	Chromosome identification; tissue typing; antianemic; CHEPO.		
XX			
OS	Pan troglodytes.		
XX			
FT	Key	Location/Qualifiers	
FT	Misc-difference	82	
FT	/label=	unknown	
FT	/note=	"X is any amino acid except for proline"	
FT	Misc-difference	84	
FT	/label=	Unknown	
FT	/note=	"X is any amino acid except for proline"	
XX			
PN	WO200274807-A2.		
XX			
PD	26-SEP-2002.		
XX			
PF	14-FEB-2002; 2002WO-US04773.		
XX			
PR	20-MAR-2001; 2001US-0813775.		
XX			
PA	(GETH ) GENENTECH INC.		
XX			
PI	Desauvage F, Henner DJ;		
XX			
DR	WPI: 2002-759880/82.		
XX			
PT	New immunoathesis comprising a chimpanzee erythropoietin (CHEPO)		
PT	polypeptide, useful for the treatment of blood disorders with low or		
PT	defective red blood cell production		
XX			
PS	Claim 2; Page 82; 120pp; English.		
XX			
CC	The invention relates to immunoathesis comprising chimpanzee		
CC	erythropoietin (CHEPO) polypeptide. The invention further relates to		
CC	methods using and compositions comprising CHEPO immunoathesis. The		
CC	methods and compositions of the present invention are useful for the		
CC	treatment of blood disorders characterised by low or defective red		
CC	blood cell production. The CHEPO polypeptides may also be used as		
CC	molecular weight markers, tissue typing and chromosome identification.		
CC	CHEPO DNA is used in gene therapy. The present sequence is chimpanzee		
CC	erythropoietin protein.		
XX			
SO	Sequence	193 AA:	
QY	Query Match	98.9%; Score 980; DB 23; Length 193;	
DB	Best Local Similarity	99.0%; Pred. No. 1.1e-98;	
	Matches	191: Conservative 2; Mismatches 0; Indels 0; Gaps 0	
DB	1	MGVHCPCMWLLSLSLPLGLPLVPLGAPPRICDSRYLRLLEAKENITTGCAEHC	60
	1	MGVHCPCMWLLSLSLPLGLPLVPLGAPPRICDSRYLRLLEAKENITTGCAEHC	60

QY	61	SLAENITVPDTKKNFAFKMRKNSXQQAWEVWOGALLSEAVLRQALLVNSSQWPELQI	120
Db	61	SLAENITVPDTKKNFAFKMRKNSXQQAWEVWOGALLSEAVLRQALLVNSSQWPELQI	120
QY	121	HYDKAVSGLRSLTTLRLALGAQKKEALISPPDAASAAPLRTITADPFRKLFVYSNFLRGKL	180
Db	121	HYDKAVSGLSLTTLRLALGAQKKEALISPPDAASAAPLRTITADPFRKLFVYSNFLRGKL	180
QY	181	KLYTGACRTGDR 193	
Db	181	KLYTGACRTGDR 193	
RESULT 9			
ID	AAV94536	standard: protein; 193 AA.	
AC	AAV94536:		
DT	28-NOV-2000	(first entry)	
XX			
DE		Human erythropoietin mutant E55N/G57T.	
KW		Human: erythropoietin; Epo; glycosylation; anaemia;	
KW		chronic renal failure; myelosuppressive therapy; cancer;	
KW		viral infection; HIV; blood loss; muten; mutant.	
XX			
OS		Homo sapiens.	
XX		Synthetic.	
FH	Key	Location/Qualifiers	
FT	Peptide	1..27	
FT		/label= Signal	
FT	Misc-difference	55	
FT		/note= "Wild-type Glu substituted by Asn"	
FT	Modified-site	55..57	
FT		/note= "Asn is glycosylated"	
FT	Misc-difference	57	
FT		/note= "Wild-type Gly substituted by Thr"	
XX			
PN		W0200024893-A2.	
PD		04-MAY-2000.	
XX			
PF		18-OCT-1999: 99MO-US24435.	
XX			
PR		23-OCT-1998: 98US-0178292.	
XX			
PA		(AMGE-) AMGEN INC.	
XX			
PI		Egrie JC, Elliott SG, Brown JK;	
DR		WPI: 2000-350735/30.	
XX			
PT		Raising and maintaining hematocrit in a mammal by administering an	
PT		effective amount of a hyperglycosylated analog of erythropoietin,	
PT		useful for treating anemia associated with myelosuppressive therapy or	
XX		excessive blood loss -	
XX			
XX		Claim 27: Page -: 63pp: English.	
XX			
XX		Human erythropoietin (Epo) is a glycoprotein hormone necessary	
CC		for the maturation of erythroid progenitor cells into erythrocytes.	
CC		It has been discovered that hyperglycosylated Epo has a longer	
CC		half-life and greater in vivo activity than recombinant human Epo.	
CC		The present sequence is the hyperglycosylated Epo mutant E55N/G57T.	
CC		This and several other hyperglycosylated Epo mutants (AAV94531 to	
CC		AAV94544) have been made by in vitro mutagenesis. Hyperglycosylated	
CC		Epo analogs are useful as they may be used instead of recombinant	
CC		Epo to increase and maintain the level of red blood cells in mammals.	
CC		The Epo analogs may be used to treat or prevent anaemia associated	
CC		with chronic renal failure, myelosuppressive therapy, certain cancers,	
CC		vital disease such as HIV and excessive blood loss.	



Query Match 98.2%; Score 973; DB 8; Length 193;  
Best Local Similarity 97.9%; Pred. No. 6.5e-98;  
Matches 189; Conservative 0; Mismatches 4; Indels 0; Gaps 0;

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QY      1 MGVHECPAMWLMLLSLSPGLGIPVIGAPPRLICDSRVLERYLEKKEAENITTCGAENC 60
        |||
DB       1 MGVHECPAMWLMLLSLSPGLGIPVIGAPPRLICDSRVLERYLEKKEAENITTCGAENC 60
QY      61 SLNENITVPDTKYNFYAMKRNXSXQOAVEMOGIALISEAVLRGQALLVNSSQPMWEPDLO 120
        |||
DB       61 SLNENITVPDTKYNFYAMKRMEYGOQAVEWOGIALISEAVLRGQALLVNSSQPMWEPDLO 120
QY      121 HDKAVSGLRSLTTLRALGAQKEAISPDDAASAPLRITTDTFPKLFRVYSNPLRGKL 180
        |||
DB       121 HDKAVSGLRSLTTLRALGAQKEAISPDDAASAPLRITTDTFPKLFRVYSNPLRGKL 180
QY      181 KLYTGEACRTGDR 193
        |||
DB       181 KLYTGEACRTGDR 193
```

## RESULT 12

AAR65499  
ID AAR65499 standard; Protein; 193 AA.

AC AAR65499;

DT 25-MAR-2003 (updated)

DT 24-JUN-1995 (first entry)

DE Human prepro-erythropoietin.

DE Erythropoietin; therapeutic; ss.

OS Synthetic.

FT Key 1..27 Location/Qualifiers

FT Peptide 1..27 /note="leader peptide"

PN WO9425055-A1.

PD 10-NOV-1994.

PF 29-APR-1994; 94WO-US04755.

PR 29-APR-1993; 93US-0055076.

PA (ABBO ) ABBOTT LAB.

PI Devries PJ, Mellovitz BS, Meuth JL, Okasinski GF.

PI Schaefer VG;

DR WPI: 1994-357906/44.

DR N-PSDB: AAO74760.

PT Erythropoietin analogues - useful for treatment of anaemia and

PT have enhanced erythropoietic effect.

PS Disclosure; Page 38-39; 56pp; English.

XX DNA encoding human prepro-erythropoietin may be ligated into an

XX expression vector for erythropoietin expression in a CHO

XX cell culture. Site-directed mutagenesis may be used in the

XX construction of EPO analogues with improved activity, which may be

XX used in pharmaceutical compositions for inducing erythropoiesis and

XX treating anaemia.

XX (Updated on 25-MAR-2003 to correct PN field.)

XX Sequence 193 AA;

Query Match 98.2%; Score 973; DB 15; Length 193;

Best Local Similarity 97.9%; Pred. No. 6.5e-98;  
Matches 189; Conservative 0; Mismatches 4; Indels 0; Gaps 0;

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QY      1 MGVHECPAMWLMLLSLSPGLGIPVIGAPPRLICDSRVLERYLEKKEAENITTCGAENC 60
        |||
DB       1 MGVHECPAMWLMLLSLSPGLGIPVIGAPPRLICDSRVLERYLEKKEAENITTCGAENC 60
QY      61 SLNENITVPDTKYNFYAMKRNXSXQOAVEMOGIALISEAVLRGQALLVNSSQPMWEPDLO 120
        |||
DB       61 SLNENITVPDTKYNFYAMKRMEYGOQAVEWOGIALISEAVLRGQALLVNSSQPMWEPDLO 120
QY      121 HDKAVSGLRSLTTLRALGAQKEAISPDDAASAPLRITTDTFPKLFRVYSNPLRGKL 180
        |||
DB       121 HDKAVSGLRSLTTLRALGAQKEAISPDDAASAPLRITTDTFPKLFRVYSNPLRGKL 180
QY      181 KLYTGEACRTGDR 193
        |||
DB       181 KLYTGEACRTGDR 193
```

## RESULT 13

AAR81982  
ID AAR81982 standard; Protein; 193 AA.

AC AAR81982;

DT 25-MAR-2003 (updated)

DT 27-FEB-1996 (first entry)

DE Human erythropoietin.

DE Erythropoietin; sialylation; sialic acid; glycosylation;

KW reticulocyte; red blood cell; erythrocyte; haematocrit.

XX Homo sapiens.

FT Key 1..27 Location/Qualifiers

FT Peptide 1..27 /label= Sig\_peptide

FT Modified-site 51 /label= N-glycosylation\_site

FT Modified-site 65 /label= N-glycosylation\_site

FT Modified-site 110 /label= N-glycosylation\_site

FT Modified-site 153 /label= N-glycosylation\_site

FT Modified-site /label= O-glycosylation\_site

PN EP668351-A1.

PD 23-AUG-1995.

PF 12-OCT-1990; 95EP-0101849.

PR 09-OCT-1990; 90WO-US05758.

PR 13-OCT-1989; 89US-0421444.

PA (AMGE-) AMGEN INC.

PI Byrne TE, Elliott SG;

PI WPI: 1995-284791/38.

PT New human erythropoietin analogues with increased glycosylation -

PT have increased activity useful for increasing prodn. of

PT reticulocytes and red blood cells

PS Disclosure; Fig 5; 31pp; English.

XX Human urinary erythropoietin (AAR81982) is a glycoprotein contg. 3 N-

XX linked and 1 O-linked oligosaccharide chain. Erythropoietin

XX analogues (AAR81983-87) have been produced in which the number of

XX glycosylation sites is increased.

CC (Updated on 25-MAR-2003 to correct PF field.)  
SQ Sequence 193 AA:  
Query Match 98.2%; Score 973; DB 16; Length 193;  
Best Local Similarity 97.9%; Pred. No. 6.5e-98;  
Matches 189; Conservative 0; Mismatches 4; Indels 0; Gaps 0;  
OY 1 MGVECPAMWLLLSLSLPLGLPYLGAPPLICDSRYLYERYLLEAKAEENITTCGAHC 60  
DB 1 MGVECPAMWLLLSLSLPLGLPYLGAPPLICDSRYLYERYLLEAKAEENITTCGAHC 60  
OY 61 SLNENITVPDTRKVFYAMKRNXSXQAVEVWQGLALISEAVLRGQALLVNSSQPEPIQL 120  
DB 61 SLNENITVPDTRKVFYAMKRNXSXQAVEVWQGLALISEAVLRGQALLVNSSQPEPIQL 120  
OY 121 HDKAVSGLSRLTTLRLALGAQKEAISPDAASAAPLRTITADTFRKLFYVSNFLRGKL 180  
DB 121 HDKAVSGLSRLTTLRLALGAQKEAISPDAASAAPLRTITADTFRKLFYVSNFLRGKL 180  
OY 181 KLYTGEACRTGDR 193  
DB 181 KLYTGEACRTGDR 193  
RESULT 14  
AAR71137  
ID AAR71137 standard; protein; 193 AA.  
AC AAR71137;  
XX  
DT 25-MAR-2003 (updated)  
DT 17-OCT-1995 (first entry)  
XX  
DE Human erythropoietin.  
XX  
KW Human erythropoietin; glycosylation; sialic acid; solubility;  
KW half-life; biological activity; proteolysis resistance; anaemia;  
KW chronic renal failure.  
XX  
OS Homo sapiens.  
XX  
XX  
FH Key Location/Qualifiers  
FT Peptide 1..27  
FT /label= sig\_peptide  
XX  
PN WO9505465-A1.  
XX  
PD 23-FEB-1995.  
XX  
PF 16-AUG-1994; 94WO-US09257.  
XX  
PR 13-OCT-1989; 89US-0421444.  
PR 17-AUG-1993; 93US-0108016.  
XX  
PA (AMGE-) AMGEN INC.  
XX  
PI Byrne TE, Elliott SG;  
XX  
DR WPI: 1995-096764/13.  
XX  
XX Erythropoietin (EPO) analogues having additional glycosylation  
PT site(s) - to increase sialic acid content, thereby increasing  
PT solubility, serum half-life, biological activity and resistance  
PT to proteolysis.  
XX  
PS Disclosure: Pages 80-81; 108pp; English.  
XX  
CC AAR71137 describes the amino acid sequence of human erythropoietin  
CC (EPO), from which the inventions novel human EPO analogues were  
CC derived. The analogues have at least one additional glycosylation  
CC site, this is used to increase the sialic acid content which in  
CC turn increases the solubility, half-life, biological activity and

CC proteolysis resistance of the protein. The analogues are useful  
CC in claimed compsns. for the treatment of chronic renal failure  
CC associated anaemia.  
CC (Updated on 25-MAR-2003 to correct PN field.)  
SQ Sequence 193 AA:  
Query Match 98.2%; Score 973; DB 16; Length 193;  
Best Local Similarity 97.9%; Pred. No. 6.5e-98;  
Matches 189; Conservative 0; Mismatches 4; Indels 0; Gaps 0;  
OY 1 MGVECPAMWLLLSLSLPLGLPYLGAPPLICDSRYLYERYLLEAKAEENITTCGAHC 60  
DB 1 MGVECPAMWLLLSLSLPLGLPYLGAPPLICDSRYLYERYLLEAKAEENITTCGAHC 60  
OY 61 SLNENITVPDTRKVFYAMKRNXSXQAVEVWQGLALISEAVLRGQALLVNSSQPEPIQL 120  
DB 61 SLNENITVPDTRKVFYAMKRNXSXQAVEVWQGLALISEAVLRGQALLVNSSQPEPIQL 120  
OY 121 HDKAVSGLSRLTTLRLALGAQKEAISPDAASAAPLRTITADTFRKLFYVSNFLRGKL 180  
DB 121 HDKAVSGLSRLTTLRLALGAQKEAISPDAASAAPLRTITADTFRKLFYVSNFLRGKL 180  
OY 181 KLYTGEACRTGDR 193  
DB 181 KLYTGEACRTGDR 193  
RESULT 15  
AAR74141  
ID AAR74141 standard; Protein; 193 AA.  
AC AAR74141;  
XX  
DT 25-MAR-2003 (updated)  
DT 30-OCT-1995 (first entry)  
XX  
DE Human erythropoietin.  
XX  
KW Erythropoietin; anemia; gene therapy; gene transfer; red blood cell;  
KW RBC; erythrocyte; transformation; myoblast; EPO.  
XX  
OS Homo sapiens.  
XX  
XX  
PN WO9513376-A1.  
XX  
PD 18-MAY-1995.  
XX  
PF 09-NOV-1994; 94WO-US13066.  
XX  
PR 07-OCT-1994; 94US-0320480.  
PR 10-NOV-1993; 93US-0149871.  
XX  
PA (AMGE-) AMGEN INC.  
PA (USSC-) UNIV SOUTHERN CALIFORNIA.  
XX  
PI Hamamori Y, Kedes LH, Samal BB;  
XX  
DR WPI: 1995-194095/25.  
DR N-PSDB: AAO92296.  
XX  
XX Gene therapy for treatment of anaemia - and increasing red blood cell  
PT production by transforming red blood cells with the erythropoietin gene  
PT  
PS Disclosure: Page 38-40; 51pp; English.  
XX  
XX The amino acid sequence encoded by human EPO cDNA is given in AAR74141.  
CC Transfection of target cells, e.g. myoblasts, with EPO cDNA and  
CC implantation into muscle tissue provides increased RBC prodn.  
CC (Updated on 25-MAR-2003 to correct PN field.)  
XX  
SQ Sequence 193 AA:

Query Match 98.2%; Score 973; DB 16; Length 193;  
Best Local Similarity 97.9%; Pred. No. 6,5e-98;  
Matches 189; Conservative 0; Mismatches 4; Indels 0; Gaps 0;

QY 1 MGVHECPAMWLMLLSLSLPLGLPVLGAPPRLICDSRVLELYLLEAKAEENITTGCAEHC 60  
|||||  
1 MGVHECPAMWLMLLSLSLPLGLPVLGAPPRLICDSRVLELYLLEAKAEENITTGCAEHC 60

Db 61 SLNENTVPPDTKYNFYAMKRNKXQQAWEVWQGLALLSEAVLRGQALLVNSSQWEPQL 120  
|||||  
61 SLNENTVPPDTKYNFYAMKRMVEYGOQAVEWQGLALLSEAVLRGQALLVNSSQWEPQL 120

QY 121 HVDKAVSGLSRLTTLRALGAQKEALSPDDAASAPLRTTTADTFPKLFRVYSNFLRGKL 180  
|||||  
121 HVDKAVSGLSRLTTLRALGAQKEALSPDDAASAPLRTTTADTFPKLFRVYSNFLRGKL 180

Db 181 KLYTGEACRTGDR 193  
|||||  
181 KLYTGEACRTGDR 193

Search completed: September 8, 2003, 15:00:47  
Job time : 41 secs





	Type	L #	Hits	Search Text	DBs	Time Stamp	Comments	Error Definition	Errors
1	BRS	L1	8451	erythropoietin	USPAT; US-PGPUB; EPO; JPO; DERWENT	2003/09/08 15:36			0
2	BRS	L2	6	erythropoietin same chimpanzee	USPAT; US-PGPUB; EPO; JPO; DERWENT	2003/09/08 15:44			0
3	BRS	L3	4	(chimeric or fusion) same 2	USPAT; US-PGPUB; EPO; JPO; DERWENT	2003/09/08 15:45			0
4	BRS	L4	4768	epitope adj tag	USPAT; US-PGPUB; EPO; JPO; DERWENT	2003/09/08 15:45			0
5	BRS	L5	6843	immunoglobulin same fc	USPAT; US-PGPUB; EPO; JPO; DERWENT	2003/09/08 15:46			0
6	BRS	L6	12746	immunoglobulin same (igg or igg1)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2003/09/08 15:46			0
7	BRS	L7	0	3 same (4 or 5 or 6)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2003/09/08 15:46			0



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=> s erythropoietin (p) chimpanzee  
L1 7 ERYTHROPOIETIN (P) CHIMPANZEE

=> s L1 (p) (chimeric or fusion)  
L2 4 L1 (P) (CHIMERIC OR FUSION)

=> duplicate remove l2  
DUPLICATE PREFERENCE IS 'CAPLUS, BIOSIS'  
KEEP DUPLICATES FROM MORE THAN ONE FILE? Y/(N):n  
PROCESSING COMPLETED FOR L2  
L3 4 DUPLICATE REMOVE L2 (0 DUPLICATES REMOVED)

=> d l3 1-4 ibib abs

L3 ANSWER 1 OF 4 CAPLUS COPYRIGHT 2003 ACS on STN  
ACCESSION NUMBER: 2003:222255 CAPLUS  
DOCUMENT NUMBER: 138:248956  
TITLE: Methods for the modulation of erythropoiesis with  
chimpanzee erythropoietin (CHEPO) polypeptides and  
nucleic acids  
INVENTOR(S): Desauvage, Frederic; Henner, Dennis J.  
PATENT ASSIGNEE(S): USA  
SOURCE: U.S. Pat. Appl. Publ., 81 pp., Cont.-in-part of U.S.  
Ser. No. 552,265.  
CODEN: USXXCO  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 3  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2003054494	A1	20030320	US 2001-813775	20010320
US 6555343	B1	20030429	US 2000-552265	20000419
WO 2002074807	A2	20020926	WO 2002-US4773	20020214
WO 2002074807	A3	20030724		

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN,  
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI,  
FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP,  
KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX,  
MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL,  
TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZM, ZW, AM, AZ,  
BY, KG, KZ, MD  
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH,  
CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR,  
BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

PRIORITY APPLN. INFO.: US 2000-552265 A2 20000419  
US 2000-287594P P 20000328  
US 2001-813775 A 20010320

AB The present invention is directed to novel \*\*\*chimpanzee\*\*\*  
\*\*\*erythropoietin\*\*\* polypeptides and to nucleic acid mols. encoding  
those polypeptides. Also provided herein are vectors and host cells  
comprising those nucleic acid sequences, \*\*\*chimeric\*\*\* polypeptide  
mols. comprising the polypeptides of the present invention fused to  
heterologous polypeptide sequences, and antibodies which bind to the  
polypeptides of the present invention.



L3 ANSWER 2 OF 4 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC on STN  
 ACCESSION NUMBER: 2003:248663 BIOSIS  
 DOCUMENT NUMBER: PREV200300248663  
 TITLE: Chimpanzee erythropoietin (CHEPO) polypeptides and nucleic acids encoding the same.  
 AUTHOR(S): DeSauvage, Frederic (1); Henner, Dennis J.  
 CORPORATE SOURCE: (1) Foster City, CA, USA USA  
 ASSIGNEE: Genentech Inc.  
 PATENT INFORMATION: US 6555343 April 29, 2003  
 SOURCE: Official Gazette of the United States Patent and Trademark Office Patents, (Apr. 29 2003) Vol. 1269, No. 5, pp. No  
 Pagination. <http://www.uspto.gov/web/menu/patdata.html>.  
 e-file.  
 ISSN: 0098-1133.

DOCUMENT TYPE: Patent  
 LANGUAGE: English

AB The present invention is directed to novel \*\*\*chimpanzee\*\*\*  
 \*\*\*erythropoietin\*\*\* polypeptides and to nucleic acid molecules encoding those polypeptides. Also provided herein are vectors and host cells comprising those nucleic acid sequences, \*\*\*chimeric\*\*\* polypeptide molecules comprising the polypeptides of the present invention fused to heterologous polypeptide sequences, antibodies which bind to the polypeptides of the present invention and to methods for producing the polypeptides of the present invention.

L3 ANSWER 3 OF 4 CAPLUS COPYRIGHT 2003 ACS on STN  
 ACCESSION NUMBER: 2002:736286 CAPLUS  
 DOCUMENT NUMBER: 137:257948  
 TITLE: Chimpanzee erythropoietin (CHEPO) - immunoadhesins for use in regulating erythropoiesis  
 INVENTOR(S): Desauvage, Frederic; Henner, Dennis J.  
 PATENT ASSIGNEE(S): Genentech, Inc., USA  
 SOURCE: PCT Int. Appl., 120 pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 3  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002074807	A2	20020926	WO 2002-US4773	20020214
WO 2002074807	A3	20030724		
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				

US 2003054494 A1 20030320 US 2001-813775 20010320  
 PRIORITY APPLN. INFO.: US 2001-813775 A 20010320  
 US 2000-552265 A2 20000419

AB The present invention is directed to immunoadhesins comprising chimpanzee erythropoietin (CHEPO) polypeptides. The immunoadhesins have an enhanced in vivo half-life compared to the corresponding CHEPO polypeptide and retains CHEPO biol. activity. Also provided herein are nucleic acid mols. encoding such immunoadhesins, vectors and host cells comprising those nucleic acid sequences, and methods using and compns. comprising the CHEPO immunoadhesins.

L3 ANSWER 4 OF 4 CAPLUS COPYRIGHT 2003 ACS on STN  
 ACCESSION NUMBER: 2000:814616 CAPLUS  
 DOCUMENT NUMBER: 134:1044  
 TITLE: Chimpanzee erythropoietin and cDNA and methods of modulating erythropoiesis  
 INVENTOR(S): Desauvage, Frederic; Henner, Dennis J.  
 PATENT ASSIGNEE(S): Genentech, Inc., USA  
 SOURCE: PCT Int. Appl., 109 pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 3  
 PATENT INFORMATION:



PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2000068376	A1	20001116	WO 2000-US12370	20000505
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
RW: GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
US 6555343	B1	20030429	US 2000-552265	20000419
EP 1177285	A1	20020206	EP 2000-928879	20000505
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
JP 2002543784	T2	20021224	JP 2000-616342	20000505
US 1999-307307 A 19990507 US 2000-287594P P 20000328 US 2000-552265 A 20000419 WO 2000-US12370 W 20000505				
AB The present invention is directed to novel ***chimpanzee*** ***erythropoietins*** and to nucleic acid mols. encoding those polypeptides. Also provided herein are vectors and host cells comprising those nucleic acid sequences, ***chimeric*** proteins comprising the ***erythropoietins*** of the present invention fused to heterologous protein sequences, antibodies which bind to the proteins of the invention, and to methods for producing the proteins of the invention. Agonists and antagonists of ***erythropoietin*** may be used to modulate erythropoiesis.				
REFERENCE COUNT: 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT				

=> s epitope tag  
L4 1990 EPI TOPE TAG

=> s immunoglobulin (p) fa  
L5 1133 IMMUNOGLOBULIN (P) FA

=> s immunoglobulin (p) igg or igg1  
L6 124027 IMMUNOGLOBULIN (P) IGG OR IGG1

=> s immunoglobulin (p) (igg or igg1)  
L7 93467 IMMUNOGLOBULIN (P) (IGG OR IGG1)

=> s immunoglobulin (p) fc  
L8 27914 IMMUNOGLOBULIN (P) FC

=> s l4 and (l7 otr l8)  
MISSING OPERATOR L7 OTR  
The search profile that was entered contains terms or nested terms that are not separated by a logical operator.

=> s l4 and (l7 or l8)  
L9 34 L4 AND (L7 OR L8)

=> d his

(FILE 'HOME' ENTERED AT 15:50:53 ON 08 SEP 2003)

FILE 'MEDLINE, CAPLUS, BIOSIS, EMBASE, SCISEARCH, AGRICOLA' ENTERED AT 15:51:17 ON 08 SEP 2003

L1 7 S ERYTHROPOIETIN (P) CHIMPANZEE  
 L2 4 S L1 (P) (CHIMERIC OR FUSION)  
 L3 4 DUPLICATE REMOVE L2 (0 DUPLICATES REMOVED)  
 L4 1990 S EPI TOPE TAG  
 L5 1133 S IMMUNOGLOBULIN (P) FA  
 L6 124027 S IMMUNOGLOBULIN (P) IGG OR IGG1  
 L7 93467 S IMMUNOGLOBULIN (P) (IGG OR IGG1)  
 L8 27914 S IMMUNOGLOBULIN (P) FC  
 L9 34 S L4 AND (L7 OR L8)

=> s l3 and (l4 or l7 or l8)  
L10 3 L3 AND (L4 OR L7 OR L8)





=> s desauvage frederic/au  
L11 4 DESAUVAGE FREDERIC/AU

=> s henner dennis/au  
L12 12 HENNER DENNIS/AU

=> s l11 or l12  
L13 16 L11 OR L12

=> s l13 and l3  
L14 4 L13 AND L3

=> s l14 not l3  
L15 0 L14 NOT L3

=> d his

(FILE 'HOME' ENTERED AT 15:50:53 ON 08 SEP 2003)

FILE 'MEDLINE, CAPLUS, BIOSIS, EMBASE, SCISEARCH, AGRICOLA' ENTERED AT  
15:51:17 ON 08 SEP 2003

L1 7 S ERYTHROPOIETIN (P) CHIMPANZEE  
L2 4 S L1 (P) (CHIMERIC OR FUSION)  
L3 4 DUPLICATE REMOVE L2 (0 DUPLICATES REMOVED)  
L4 1990 S EPITOPE TAG  
L5 1133 S IMMUNOGLOBULIN (P) FA  
L6 124027 S IMMUNOGLOBULIN (P) IGG OR IGG1  
L7 93467 S IMMUNOGLOBULIN (P) (IGG OR IGG1)  
L8 27914 S IMMUNOGLOBULIN (P) FC  
L9 34 S L4 AND (L7 OR L8)  
L10 3 S L3 AND (L4 OR L7 OR L8)  
L11 4 S DESAUVAGE FREDERIC/AU  
L12 12 S HENNER DENNIS/AU  
L13 16 S L11 OR L12  
L14 4 S L13 AND L3  
L15 0 S L14 NOT L3

=> log y

COST IN U.S. DOLLARS

SINCE FILE	TOTAL
ENTRY	SESSION
50.04	50.25

FULL ESTIMATED COST

DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)

SINCE FILE	TOTAL
ENTRY	SESSION
-1.95	-1.95

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STN INTERNATIONAL LOGOFF AT 15:58:48 ON 08 SEP 2003

